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EFFORTS TO IMPROVE STUDENTS' MATHEMATICAL CONCEPTS UNDERSTANDING ABILITY USING DIENES BLOCK MEDIA

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ABSTRACT

The ability to understand mathematical concepts is one of the most important abilities and must be owned by every student. This happens because the ability to understand concepts is the basis for having other The ability to understand mathematical concepts is one of the most important abilities and must be owned by every student. This happens because the ability to understand concepts is the basis for having other mathematical abilities. However, the reality on the ground, according to the results of observations and interviews with an elementary school (SD) teacher in Sumedang Regency, is known that in learning mathematics, the ability to understand mathematics is still relatively low. One of the media that is expected to improve the ability of students to understand mathematical concepts is dienes block media. This study aims to determine whether there are differences in the ability to understand mathematical concepts between students who receive learning using Dienes block media and students who learn without using Dienes block media in addition material. The method used in this study was quasi-experimental with nonequivalent pre-test-post-test control group design. The instrument used is a test of ability to understand mathematical concepts (pre-test and post-test). The population in this study were all grade II students at SDN Cilengkrang 2022/2023 with a total of 54 people. The sample used was the total sample, namely class II A which consisted of 29 students as the control class and class II B which consisted of 25 students as the experimental class. In the learning process, the experimental class used Dienes block media and the control class did not use Dienes block media. Based on the results of data analysis, it was concluded that there were differences in the ability to understand mathematical concepts between students who received learning using Dienes block media and students who received learning without using Dienes block media in addition material. Students who receive learning with Dienes block media have the ability to understand mathematical concepts better than students who learn without Dienes block media.
Keywords: Concept Understanding Ability, Dienes Block

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PRELIMINARY

Education plays an important role in preparing qualified and competent human resources in the development of science and technology, so that education must be carried out as well as possible to obtain maximum results. This is in accordance with Constitution

No. 20 of 2003 about the National Education System which states that, "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, as well as the skills needed by himself, society, nation and state." Human can experience changes in both the ability to think, attitude, and behavior through education.

Constitution No. 20 of 2003 about the National Education System Chapter II Article 3 is the main reference for organizing learning in any field of study, including in the field of mathematics. The following is the contents of the law, "National Education aims to develop the potential of students to become human beings who believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent and become citizens of a democratic and responsible state".

Mathematics is one of the most important subjects and is always related to everyday life. Starting from counting, measuring, reading time, looking at various shapes and shapes, making graphs/tables and so on. Consciously or unconsciously, every activity that humans do is always related to mathematics. James and James (Hasanah, 2010) states that, "Mathematics is one of the subjects that becomes one of the systems in training their reasoning. Through mathematics lessons it is hoped that it will increase abilities, develop skills and their applications. In addition, mathematics is a means of thinking in determining and developing science and technology, even mathematics is an approach to thinking logically, systematically and consistently. This proves that mathematics has an important role in human life. Mathematics must be used in such a way that it can be useful for life and it must be instilled in the minds of students from the start. Therefore, the notion that mathematics is scary will disappear. Instill in students to love mathematics so they can lead this country towards a better future.

The ability to understand mathematical concepts is one of the most important abilities and must be owned by every student ((Dini et al., 2018)(Fitriani & Maulana, 2016)(Putra et al., 2018)). This happens because the ability to understand concepts is the basis for having other mathematical abilities as stated by (Hardiyanti et al., 2017). Furthermore, (Andamon & Tan, 2018) stated that understanding mathematical concepts is knowledge that involves a thorough understanding of the foundations underlying the concepts behind algorithms carried out in mathematics. If students do not have this ability, they will have difficulty in absorbing mathematical material in the learning process (Pujakusuma & Pramuditya, 2023). However, the reality on the ground, according to the

results of observations and interviews with an elementary school (SD) teacher in Sumedang Regency, is known that in learning mathematics, the ability to understand mathematics is still relatively low. The low ability to understand concepts does not only occur in Sumedang Regency but in other Regencies as well (Prasasti et al., 2020)(Buyung et al., 2022). This can be seen from the level of success of students in the ability to understand mathematical concepts students still do not meet the Minimum Completeness Criteria (KKM). Moreover, students do a lot of questions that the teacher usually uses during learning, so that when the teacher gives questions that are different from the questions that are usually used, students don't understand how to work on the questions. This means that the ability to understand mathematics is still lacking. This could be caused by a lack of understanding of the material or object being studied. (Andamon & Tan, 2018) states that, the common core standards in mathematics stress the importance of conceptual understanding as a key component of mathematical expertise. This is in line with the opinion of (Rosmawati & Sritresna, 2021) that the ability to understand concepts is an ability to master material and students' abilities to understand, absorb, master, and apply it in learning mathematics.

Assessment understanding, which is a translation of "mathematical understanding", is different from the level of understanding in Bloom's taxonomy. In Bloom's taxonomy, in general indicators of understanding mathematics include: recognizing and applying mathematical concepts, procedures, principles and ideas correctly in simple cases. However, in fact, understanding mathematics has a different level of depth of cognitive demands. Some experts classify the level of depth of cognitive demands of understanding mathematics in several stages (Hendriana et al., 2014) as follows.

1. Polya classifies comprehension abilities at four levels, as follows.
    a. Mechanical understanding. At this level, one can remember and apply formulas routinely and calculate simply, this ability is classified as a low level ability.
    b. Inductive understanding. At this level, one can apply formulas or concepts in simple cases or in similar cases. This ability is classified as a low level ability.
    c. Rational understanding. At this level, one can prove the truth of a formula and theorem. This ability is classified as a high level ability.
    d. Intuitive understanding. At this level, one can estimate the truth with certainty (without hesitation) before analyzing further. This ability is classified as a high level ability.
2. Pollatsek categorizes comprehension abilities at two levels, as follows.

a. Computational understanding. At this level, one can apply formulas in simple calculations, and perform calculations algorithmically. This ability is classified as a low level ability.
b. Functional understanding. At this level, one can associate one concept/principle with another concept/principle, and is aware of the process it is working on. This ability is classified as a high level ability.

3. Skemp classifies comprehension abilities at two levels, as follows.
   a. Instrumental understanding. At this level, one memorizes concepts/principles without any relation to others, can apply formulas in simple calculations, and performs algorithmic calculations. This ability is classified as a low level ability.
   b. Relational understanding. At this level, one can associate one concept/principle with another. This ability is classified as a high level ability.
4. Copeland categorizes comprehension abilities at two levels, as follows.
   a. Knowing how to. At this level, one can do a routine/algorithmic calculation. This ability is classified as a low level ability.
   b. Knowing. At this level, one can do a calculation consciously. This ability is classified as a high level ability.

Mathematical understanding is very important so that learning mathematics becomes more meaningful, because students can make connections between prior knowledge and the new knowledge they face. According to (Murizal, 2012), "Understanding is a translation of the term understanding which is defined as the absorption of the meaning of a material being studied". Meanwhile, Purwanto (Murizal, 2012) states that, "Understanding is the level of ability that expects students to be able to understand the meaning or concept, situation and facts they know". Whereas in mathematics, a concept is an abstract idea that allows one to classify an object or event.

Understanding the concept is very important for students. Therefore, teachers are required to be able to package learning more fun. In mathematics, not only learning models are used but learning media also need to be given to students to build their own knowledge. Hamidjojo (Kustandi, Cecep; Sutjipto, 2011) states that, "Media as all forms of intermediaries used by humans to convey or spread ideas, ideas or opinions so that the ideas, ideas or opinions expressed reach the intended recipient". (Yusuf & Nugraha, 2020) state that learning media can help students to increase understanding, present data in an interesting and reliable manner, facilitate interpretation of data and condense information.

Block dienes is a game tool that is used as a media/tool in learning arithmetic, be it addition, subtraction, multiplication, or division. Dienes argues that every concept or principle in mathematics that is presented in concrete form will be well understood, meaning that objects or objects in the form of games will play a very important role if manipulated properly in teaching mathematics. Ruseffendi (Ruseffendi, 1980) states that, "This teaching aid serves to teach the concept or understanding of many objects, comparing and sorting many objects, the place value of a number (units, tens, hundreds, and thousands) as well as the operations of addition, subtraction, multiplication, and distribution according to class level". An example of dienes block media can be seen in the following figure.

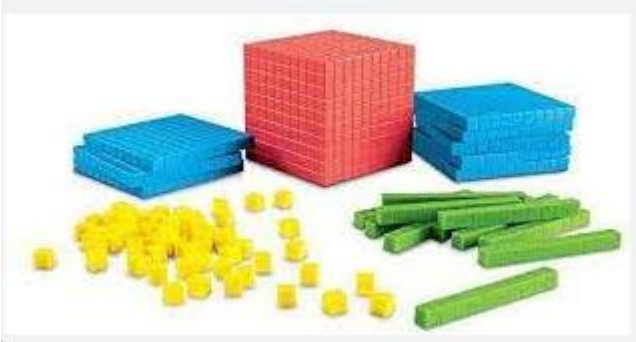

Figure 1. Dienes Block Media

Sukayati & Suharjana (2009), explains that the use of visual aids in the learning process is proven to help students understand mathematical concepts. The followings are the advantages of using Dienes block media as teaching aids in mathematics.

1) Providing the ability to think mathematics creatively. For some children, mathematics seems like a rigid system containing only symbols and a set of propositions to solve. In fact, mathematics has many relationships to develop creativity
2) Developing a favorable attitude towards mathematical thinking. The atmosphere of learning mathematics in the classroom must be made as attractive as possible, so that students can enjoy the lesson. This kind of atmosphere is one thing that can make students gain confidence in their ability to learn mathematics through experiences that are familiar with their lives.
3) Supporting mathematics outside the classroom, demonstrating the application of mathematics to real situations. Students can connect their learning experiences with experiences in everyday life. By using their respective skills, they can investigate or observe the objects around them, then organize them to solve a problem.

4) Providing motivation and facilitates abstraction. With visual aids, students are expected to gain new and enjoyable experiences, so that they can relate them to abstract mathematics.

From the objectives above, Dienes block media, as a teaching tool in learning mathematics, is expected to make problems more interesting for students. Because the discoveries obtained from students' activities usually start from the appearance of things that are question marks, the problem being investigated must be based on the object that attracts students' attention.

The steps for using Dienes block media in material for arithmetic addition operations in mathematics can be done as follows.

1) Introduction of Dienes block media
   a) Students recognize the small cubes on the Dienes block media as a unit in which there are 9 in each package.
   b) Students recognize the shape of the bars on the Dienes block media as dozens, each of which has 90 packets.
   c) Students recognize the shape of the pieces on the Dienes block media as hundreds which total 100.
2) Example of using Dienes block media in Sum
   a) Give sum questions.
   b) Students read the first number of the question.
   c) Place the blocks according to the first number in their respective place values. Tens in the tens place, ones in the ones place.
   d) Students read the second number or the sum number.
   e) Place the blocks according to the second number or additive at their respective place values. Tens in the tens place, ones in the ones place.
   f) Students then read the sum question indicated by the number of blocks.
   g) According to the implementation of the sum operation, combine the unit blocks first and place them in the unit result box.
   h) Every 10 blocks of units, replace it with 1 block of tens and place it in the tens result box.
   i) Continue merging the tens block and place it in the tens result box.
   j) Every 10 blocks of tens, replace it with 1 block of hundreds and place it in the hundreds result box.

k) Count the number of blocks in the result box according to their respective place values.

l) Students then write down the results obtained in the answers. This activity can be carried out repeatedly with different numbers so that students really understand how to use Dienes block media in sum. This can be done with the guidance of the teacher or by the students themselves.

m) The purpose of this study was to determine the effect of using dines block media on the ability to understand mathematical concepts of elementary school students in addition material. In this study, we will compare the mathematical understanding abilities of students who use dines block media and students whose mathematics learning does not use dines block media.

METHODS

The method used in this research is the experimental method. (Sugiyono, 2006) states that, “Experimental research methods can be interpreted as research methods used to seek certain influences on others under controlled conditions”. Arikunto (Lestari et al., 2015) states that, “The experimental method is a way to look for a causal relationship (causal relationship) between two factors that are deliberately generated by researchers by eliminating or reducing or setting aside other disturbing factors”. While the design in this study was a quasi-experimental design with a non-equivalent pre-test-post-test control group design. There are two classes in this design. The first class is an experimental class that is given learning treatment using Dienes block media, while the control class is a comparison class that is given learning without using Dienes block media. Furthermore, to see a comparison of the level of students' understanding of mathematical concepts in the sum material, the pre-test and post-test were used. The sample in this study was class II A with a total of 29 students as the control class and class II B totaling 25 students as the experimental class.

The instrument used in this study was a test of understanding mathematical concepts. The form of the test given is a description. The tests in this study were pre-test and post-test. The pretest was given at the beginning of the meeting before being given treatment. This is done to find out the basic ability to understand addition material by giving students a written test in the form of descriptions of six questions in accordance with the material to be taught. The post-test is given at the end of the meeting after being given treatment, the techniques and questions of the post-test are the same as when the pre-

test was carried out, the post-test is carried out to find out how much the ability to understand mathematical concepts regarding addition material has increased after being given treatment.

Data analysis used in this research is quantitative data. Quantitative data are test results obtained from the results of the pre-test and post-test. Data from the test results were analyzed using the steps that can be seen in Figure 2.

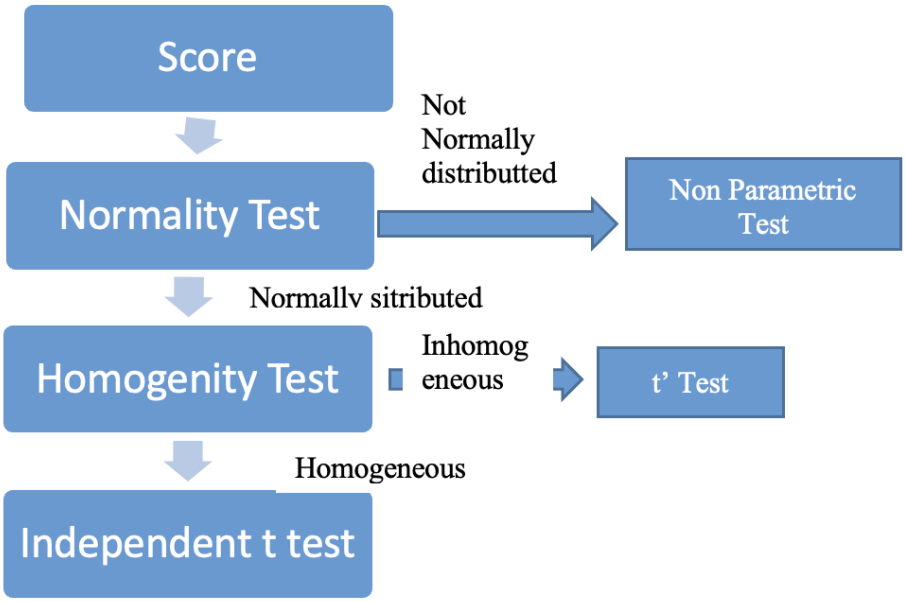

Figure 2. Data Analysis Steps

The data processing was carried out to answer the problem formulation and prove the hypothesis in this study. From the data from the pretest results, it is used to determine differences in the basic abilities of understanding mathematical concepts, the posttest is used to determine differences in the results of the final ability to understand mathematical concepts, so that the data collected needs to be processed using appropriate analytical techniques.

RESULT AND DISCUSSION

The research was started by conducting a pre-test in both classes with the aim of knowing the basic abilities in the two classes. The results of the experimental class pre-test are depicted in diagram 1 below.

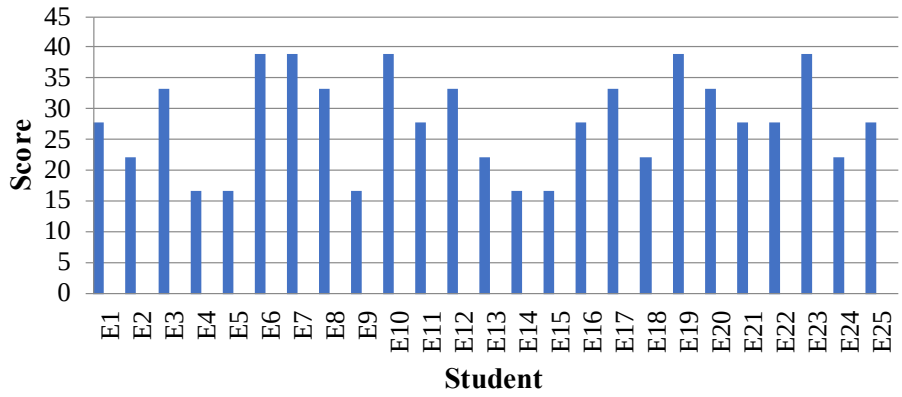

Diagram 1. Pre-Test Score Of Experimental Class Translate

Based on the diagram 1, in the experimental class the lowest score was 16.7, the highest score was 38.9 and the average score was $(\bar{x})$ 28. Meanwhile, data from the control class pre-test results are depicted in diagram 2 below.

Diagram 2. Pre-Test Score Of Control Class

Based on the diagram 2, in the control class the lowest score was 16.7, the highest score was 38.9 and the average score was $(\bar{x})$ 28.7. This shows that the basic abilities of the experimental class and control class are relatively the same as the average score of the experimental class is 28 and the average score of the control class is 28.7. To see the significance or not of the average difference, a statistical test was carried out.

Table 1. Pre-test Normality Data Test Results

Class	L_{count}	$L_{critical}$	Explanation
Experimental	0,1273	0,1730	H_0 is accepted
Control	0,1419	0,1634	H_0 is accepted

From table 1, it can be seen that L_{hitung} in the experimental class and control class is 0.1273 and 0.1419 and L_{tabel} is in the experimental class and control class is 0.1730 and 0.1634. It means that $L_{hitung} < L_{tabel}$ thus H_0 has been accepted, which means that the data is normally distributed, so that the pre-test data for the experimental class and the control class both come from normally distributed data.

Subsequent tests were carried out by testing the homogeneity of the two pre-test data variances between the two classes using the *F* test, and to look for the *F* test is to know the value of the largest variance and the smallest variance of the variance values of the two classes.

Table 2. Pre-test Homogeneity Data Test Results

Class	Standard Deviation	Variances	F_{count}	$F_{critical}$	Explanation
Experimental	7,9	62,41	1,08	1,91	H_0 is accepted
Control	7,6	57,76			

Based on table 2, the homogeneity test of the two pre-test data variances, it was obtained that F_{hitung} for both classes was 1.08. With the first degree of freedom $dk_1 = 24$ and the second degree of freedom $dk_2 = 28$ and a significance level of 5% obtained F_{tabel} namely $F_{0,05(24/28)} = 1,91$. It turns out that $F_{hitung} = 1,08 < F_{tabel} = 1,91$. Based on the test criteria, H_0 is accepted. Therefore, it can be concluded that the variance of the two sample groups is homogeneous.

After obtaining the results of the pre-test data that is normally distributed and has a homogeneous variance, it can be continued by using the *t* test. The *t* test was conducted to find out the significant difference in the average between the two classes with the sample average.

Table 3. Pre-test Homogeneity Data Test Results

Class	Average	*Dk*	t_{count}	$t_{critical}$	Explanation
Experimental	28	52	$-0,35$	2,007	H_0 is accepted
Control	28,7				

From table 3, it can be seen that $t_{hitung} = -0,35$ with digrees of freedom (*dk*) = 52. Because $t_{hitung} = -0,35$ is in the area of acceptance H_0 namely

$-t_{tabel} = -2{,}007 < t_{hitung} = -0{,}35 < t_{tabel} = 2{,}007$, therefore H_o is accepted. In conclusion, there is no difference in the ability to understand basic mathematical concepts of students in the two classes in the sum material. Based on the results of statistical test calculations on the pre-test data, it can be concluded that there is no difference in the ability to understand basic mathematical concepts of students in both classes in the sum material.

The research was continued by providing treatment in the form of using Dienes block media in the learning process in the experimental class and learning without using Dienes block media in the control class. After that, a post-test was given to students in both classes with the following results.

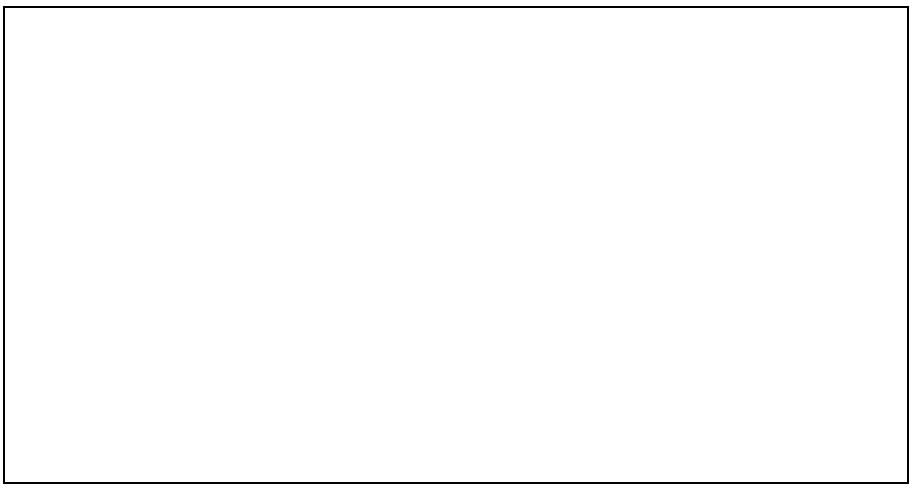

Diagram 3.Post-Test Score Of Experimental Class

Based on the diagram 3, the experimental class got the lowest score of 27.8, the highest score of 83.3 and the average score of 61.6. Meanwhile, the post-test data for the control class can be described in diagram 4 below.

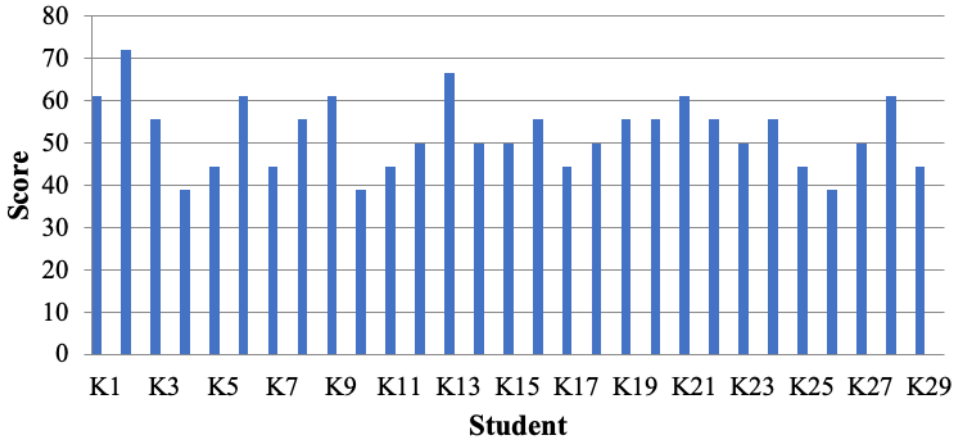

Diagram 4. Post-Test Score Of Control Class

Based on the diagram 4, the control class the lowest score was 38.9, the highest score was 72.2 and the average value was $(\bar{x})$ 52.3. From these data, it can be seen that the final ability of the experimental class is higher than that of the control class. To see the significance or not of the average difference, a statistical test was carried out.

Table 4. Post-test Normality Data Test Results

Class	L_{count}	$L_{critical}$	Explanation
Experimental	0,1354	0,1730	H_0 is accepted
Control	0,1341	0,1634	H_0 is accepted

In table 4, it can be seen that the L_{hitung} to experimental class and control class is 0,1354 and 0,1342 each, and the L_{tabel} to experimental class and control class is 0,1730 and 0,1634 each, it means that the $L_{hitung} < L_{tabel}$ thus H_0 is accepted, which means that the data is normally distributed, so that the post-test data for the experimental class and the control class both come from normally distributed data.

Another tests were carried out by testing the homogeneity of the two pre-test data variances between the two classes using the *F* test, and to find the *F* test is to know the value of the largest variances and the smallest variances of the variances values of the two classes.

Table 5. Post-Test Homogeneity Data Test Results

Class	Standard deviations	Variances	F_{count}	$F_{critical}$	Explanation
Experimental	15,1	228,01	3,16	1,91	H_0 is rejected
Control	8,5	72,25			

Based on table 5, the homogeneity test of the two variances of the post-test data, it is obtained that F_{hitung} for both classes is 3.16. With the first degree of freedom $dk_1 = 24$ d the second degree of freedom $dk_2 = 28$ and a significance level of 5%, F_{tabel} is obtained, namely $F_{0,05(24/28)} = 1,91$. It turns out that $F_{hitung} = 3,16 > F_{tabel} = 1,91$. Based on the test criteria, H_0 is rejected. Therefore, it can be concluded that the variances of the two sample groups are not homogeneous.

After obtaining post-test data that is normally distributed and does not have homogeneous variances, it can be continued by using the *t'* test. The *t'* test was carried out

to find out the significant difference in average between the two classes with the sample average.

Table 6. Post-Test *t* Data Test Results

Class	Average	t'count	t'critical	Explanation
Experimental	61,1	2,73	2,11	H_0 is rejected
Control	52,3			

In table 6 above, it can be seen that $t'_{hitung} = 2{,}73$. Because the value of $t'_{hitung} = 2{,}73$ is outside the acceptance area of H_0 namely $t'_{hitung} = 2{,}73 > t'_{tabel} = 2{,}11$, therefore H_o is rejected. In conclusion, there are differences in the ability to understand mathematical concepts of students who are using Dienes block media with students who are not using Dienes block media in the sum material. Based on the results of statistical test calculations on the post-test data, it can be concluded that there are differences in the ability to understand mathematical concepts of students who receive material learning using Dienes block media with students who receive material learning without using Dienes block media in addition material. The results of this study are in line with research conducted by (Alawiyah, 2015), (Ananda, 2017),(Syartika, 2018), (Trimurtini et al., 2019) (Marlina, 2019) where the use of dienes block media can improve student mathematics learning outcomes. The difference in learning outcomes is because learning using dienes block media carried out in the eksperiment class has given concrete things to students. This is as stated by (Trimurtini et al., 2019) that whereas block dienes media provide concrete things and students get hands-on experience when counting.

Dienes block media helps students to understand the material presented by the teacher. This is in accordance with the opinion (Yusuf & Nugraha, 2020) that learning media can help students to increase understanding, present data in an interesting and reliable manner, facilitate interpretation of data and condense information. By using the Dienes block media, it is clear that students become more active in learning and it is easier for them to understand the material presented so that they can solve the questions given by the teacher. In contrast to students who study without Dienes block media, it can be seen that these students tend to be passive and must be guided by the teacher when working on questions. In addition, based on the observations of researchers during learning using Dienes block media students look more enthusiastic and happy. This is in line with Hamalik's opinion (Yusuf & Nugraha, 2020) that "the use of learning media in the

teaching-learning process can generate new desires and interests, generate motivation and stimulate learning activities, even bring psychological influences on students". The comfortable psychological conditions of students when studying certainly have a significant impact on their cognitive abilities. This is as stated by (Yusuf et al., 2020) who stated that one of the inhibiting factors in learning is psychological factors.

In contrast to students who study without Dienes block media, it can be seen that these students tend to be passive and must be guided by the teacher when working on questions. This happens because learning in the control class has not provided concrete things to students because it is only limited to seeing the material written by the teacher and listening to the explanation, making it difficult for students to understand addition. The results of this study are in line with the results of research by (Trimurtini, et al., 2018) who also found that using media images in the control class had students experience difficulties. Based on the results of research conducted, the use of dienes media provides a different learning atmosphere for students. It is easier for students to understand the material as well as a fun learning atmosphere so that students' interest in learning mathematics also increases. (Janati, Eli; Aras, Latri; Fitri, 2019) stated that students who see directly understanding the concepts of a material on concrete objects that are being demonstrated can generate motivation and interest in learning elementary school students. Student learning interest is one of the factors that influence the ability to understand mathematical concepts (Buyung et al., 2022). Considering that the use of dienes media in this study can improve the ability to understand concepts, it is better if learning mathematics in elementary schools uses learning media. However, in this study it was limited to dienes block media and summation material. The manipulative media suggested for mathematics learning, namely tangram, banknotes, stem blocks or block dienes, pattern blocks, clocks, abacus or decks, and scales (Trimurtini, et al., 2018). Dienes blocks can also be used for subtraction, multiplication and division.

CONCLUSION

Based on the results and discussions of the effect of using Dienes block learning media on students' ability to understand mathematical concepts in the sum material in class II at SDN Cilengkrang Sumedang, it can be concluded that there are differences in the ability to understand mathematical concepts of students who receive material using Dienes block media with students who learn without using Dienes block media in the sum material. Students who receive material with Dienes block media have the ability to

understand mathematical concepts better than students who learn without Dienes block media. This is proven by the average scores of both classes.

This research adds insight into improving the ability to understand mathematical concepts by using Dienes block media and how to use Dienes block in addition material. The results of this study can be used as material for consideration in choosing learning media in mathematics learning. Further research can be carried out using dienes block media for other mathematical abilities such as mathematical communication skills or problem solving. In addition, research can also be carried out using concepts applied to dienes blocks for other materials such as one-variable linear equations.

REFERENCES

Alawiyah, T. (2015). Pengaruh Penggunaan Alat Peraga Block Dienes Terhadap Hasil Belajar Matematika Siswa Pada Pokok Bahasan Penjumlahan dan Pengurangan [*Skripsi*, Unversitas Islam Negeri Syarif Hidayatullah]. https://www.academia.edu/download/40840262/Sita_Dwi_Jayanti.pdf

Ananda, R. (2017). Peningkatan Hasil Belajar Siswa pada Materi Operasi Pengurangan Bilangan Cacah dengan Menggunakan Blok Dienes Siswa Kelas I SDN 016 Bangkinang Kota. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *1*(1), 1–11. https://doi.org/10.31004/cendekia.v1i1.2

Andamon, J. C., & Tan, D. A. (2018). Conceptual Understanding, Attitude And Performance In Mathematics Of Grade 7 Students. *International Journal of Scientific and Technology Research*, *7*(8), 96–105. https://www.ijstr.org/final-print/aug2018/Conceptual-Understanding-Attitude-And-Performance-In-Mathematics-Of-Grade-7-Students.pdf

Buyung, Wahyuni, R., & Mariyam. (2022). Faktor Penyebab Rendahnya Pemahaman Siswa Pada Mata Pelajaran. *Journal of Educational Review and Research*, *5*(1), 46–51. http://dx.doi.org/10.26737/jerr.v5i1.3538

Dini, M. D., Wijaya, T. T. W., & Sugandi, A. I. (2018). Pengaruh Self Confidence Terhadap Kemampuan Pemahaman Matematik Siswa SMP. *Jurnal Silogisme Kajian Ilmu Matematika Dan Pembelajarannya*, *3*(1), 1–7. https://doi.org/10.24269/js.v3i1.936

Fitriani, K., & Maulana, -. (2016). Meningkatkan Kemampuan Pemahaman Dan Pemecahan Masalah Matematis Siswa Sd Kelas V Melalui Pendekatan Matematika Realistik. *Mimbar Sekolah Dasar*, *3*(1), 40–52. https://doi.org/10.17509/mimbar-sd.v3i1.2355

Hardiyanti, S., Maulana, M., & Julia, J. (2017). Pengaruh Pendekatan Kontekstual Berbantuan Jarimatika Terhadap Kemampuan Pemahaman Matematis Dan Keterampilan Berhitung Siswa Pada Materi Perkalian. *Jurnal Pena Ilmiah*, *2*(1), 881–890. https://doi.org/10.17509/jpi.v2i1.11224

Hasanah, I. (2010). Pengaruh Metode Pembelajaran SQ3R Terhadap Kemampuan Pemahaman Konsep Matematika Siswa [*Skripsi*, Universitas Islam Negeri Syarif Hidayatullah Jakarta]. https://repository.uinjkt.ac.id/dspace/bitstream/123456789/1089/1/98163-ISMA HASANAH-FITK.pdf

Hendriana, H., Soemarmo, U., & Atif, N. falah. (2014). *Penilaian Pembelajaran*

Matematika. (1st ed.). Refika Aditama. http://balaiyanpus.jogjaprov.go.id/opac/detail-opac/?id=274104

Janati, E., Aras, L., & Fitri, M. F. (2019). Penggunaan Alat Peraga "Blok Dienes" Untuk Meningkatkan Pemahaman Siswa Kelas 2 Pada Materi Bilangan Bulat Di SDN 015 Balikpapan Selatan. *Global Science Education Journal*, *1*(1), 15–21. https://jurnal.sainsglobal.com/index.php/ges/article/view/694/318

Kustandi, Cecep; Sutjipto, B. (2011). *Media Pembelajaran; Manual dan Digital*. Ghalia Indonesia. http://library.fip.uny.ac.id/opac/index.php?p=show_detail&id=7558

Lestari, K. E., Yudhanegara, M. R., & Anna. (2015). *Penelitian Pendidikan Matematika : Panduan Praktis Menyusun Skripsi, Tesis dan Karya Ilmiah Dengan Pendekatan Kuantitatif, Kualitatif Dan Kombinasi Disertai Dengan Model Pembelajaran Dan Kemampuan Matematis*. Refika Aditama.

Marlina. (2019). *Pengaruh Penggunaan Media Block Dienes Terhadap Hasil Belajar Matematika Pada Siswa Kelas I Sekolah Dasar Negeri Napal Melintang Kecamatan Selangit Kabupaten Musi Rawas*. [Skripsi, Institut Agama Islam Negeri (IAIN) Bengkulu]. http://repository.iainbengkulu.ac.id/id/eprint/3539

Murizal, A. M. Y. Y. (2012). Pemahaman Konsep Matematis Dan Model Pembelajaran Quantum Teaching. *Jurnal Pendidikan Matematika*, *1*(1), 19–23. https://adoc.pub/pemahaman-konsep-matematis-dan-model-pembelajaran-quantum-te.html

Prasasti, D., Awalina, F. M., & Hasana, U. U. (2020). Permasalahan Pemahaman Konsep Siswa pada Pelajaran Matematika Kelas 3 Semester 1. *Manazhim*, *2*(1), 45–53. https://doi.org/10.36088/manazhim.v2i1.659

Pujakusuma, G. K., & Pramuditya, S. A. (2023). Students ' Mathematical Understanding Ability On The Material Of The Linear Absolute Value Of One Variable Assisted By A Digital Module. *M A T H L I N E*, *8(1)*, 48–67. https://doi.org/10.31943/mathline.v8i1.273

Putra, H. D., Setiawan, H., Nurdianti, D., Retta, I., & Desi, A. (2018). Kemampuan pemahaman matematis siswa smp di Bandung Barat. *JPPM (Jurnal Penelitian Dan Pembelajaran Matematika)*, *11*(1), 19–30. http://dx.doi.org/10.30870/jppm.v11i1.2981

Rosmawati, R. R., & Sritresna, T. (2021). Kemampuan Pemahaman Konsep Matematis ditinjau dari Self-Confidence Siswa pada Materi Aljabar dengan Menggunakan Pembelajaran Daring. *Plusminus: Jurnal Pendidikan Matematika*, *1*(2), 275–290. https://doi.org/10.31980/plusminus.v1i2.1261

Ruseffendi, E. T. (1980). *Pengajaran matematika modern : untuk orang tua murid guru dan SPG* (2nd ed.). Tarsito. http://kin.perpusnas.go.id/DisplayData.aspx?pId=26287&pRegionCode=JIUNMAL&pClientId=111

Sugiyono. (2006). *Statistik Untuk Penelitian*. CV. Alfabeta.

Sukayati, & Suharjana, A. (2009). *Pemanfaatan Alat Peraga Matematika Dalam Pembelajaran Di SD*. PPPPTK Matematika.

Syartika, R. (2018). *Pengaruh Penggunaan Media Blok Dienes Terhadap Hasil Belajar Peserta Didik Pada Pembelajaran Matematika Materi Penjumlahan Dan Pengurangan Di Kelas I MIN 8 Hulu Sungai Tengah*. [*Skripsi*, Universitas Islam Negeri Antasari]. http://idr.uin-antasari.ac.id/10081/4/AWAL.pdf

Trimurtini, -, Sofianingsih, E., Widihastrini, F., & Sumilah, -. (2019). The Effectiveness of Proportional Material in Representing Place Values in The Mathematics Learning of 2nd Grade Elementary School Students. *International Conference of Primary Education Research Pivotal Literature and Research UNNES 2018*, *303*, 164–168.

https://doi.org/10.2991/icpeopleunnes-18.2019.32

Yusuf, Y., & Nugraha, N. B. (2020). Penggunaan E-Modul Sebagai Bahan Ajar Pada Proses Pembelajaran dalam Kondisi Pandemi Covid-19. In *Call for Book Tema 3: Media Pembelajaran* (Issue 978). CV. Jakad Media Publishing. http://repository.unsap.ac.id/index.php/fkipunsap/article/view/39%0Ahttps://repository.unsap.ac.id/index.php/fkipunsap/article/download/39/49

Yusuf, Y., Suyitno, H., Sukestiyarno, Y. L., & Isnarto. (2020). The Identification of Pre-Service Mathematics Teachers' Statistical Reasoning on Descriptive Statistics. *International Journal of Advanced Science and Technology*, *29*(8), 888–898. https://doi.org/10.2991/assehr.k.200620.021