

Improving Understanding of Rectangle Perimeter Concepts Using Teaching Aids Through a Realistic Mathematical Approach Grade III students at SD Negeri 4 Napabalano, Muna Regency

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Abstract

This study aims to improve students' understanding of the concept of the perimeter of a rectangle using visual aids through a Realistic Mathematical Approach in class III SD Negeri 11 Napabalano, Muna Regency. This research is qualitative in nature. The research data collection technique was carried out by tests, interviews, observations and field notes. The type of data collection used was a class action research type. The results of the study show that learning the concept material and the circumference of a rectangle using visual aids through a Realistic Mathematical Approach can make students relaxed, happy, and not tense in learning. The learning is carried out by: (1) showing objects around which are rectangular and which are not rectangular; (2) students complete the LKS by using the visual aids that have been given; (3) Each group presented the results of their discussion while the other students gave their responses; (4) students construct the perimeter of a rectangle through the teacher's guidance; (5) students solve questions and other realistic problems. So that the provision of learning actions can be concluded that learning using visual aids by applying a realistic mathematical approach can increase students' understanding of the material around rectangles.

Keywords: *Understanding, Circumference, Rectangle, Display, Realistic*

INRODUCTION

Mathematics is a science that deals with the study of abstract forms or structures and the relationships between these things. To understand the structures and their relationships requires an understanding of the concepts contained in mathematics. This is in line with Bruner (Aisyah, 2007: 5) who says that "Learning mathematics is learning about the concepts and structures contained in the subject being studied and looking for hubungan-hubungan antara konsep-konsep dan struktur tersebut". Banyak orang assume that mathematics is difficult to learn, unpleasant, boring, scary and so on. This attitude of course resulted in decreased learning achievement towards mathematics. This should be of particular concern to elementary school (SD) teachers and prospective teachers to make an effort to improve their students' mathematics learning achievements and provide basic understanding to students for adequate mastery of concepts, so the teacher's ability to apply learning makes students easy to accept it is necessary so that students can learn well. To be able to help make it easier for students to

understand the material presented, learning mathematics in elementary schools should not be done in an abstract direction, but wherever possible be done from the general starting from concrete to abstract, from easy things to difficult things or from simple to complex. to the complex.

Based on the experience of teaching mathematics at SD Negeri 4 Napabalano in December 2007, he stated that the most difficult and difficult subject for students to understand in mathematics was geometry. While geometry is one of the core areas of mathematics in elementary school. Since childhood, elementary school students have known and been familiar with geometric visual objects around them, for example tiles, candies, table glass, clock faces, bicycle tires and so on. This will really help children in learning geometry. According to Kennedy and Tipps (1994: 385) argued that "The experience of learning geometry improves problem solving and reasoning skills and supports the study of various mathematical topics". Therefore, geometry in elementary schools is a strategic study to encourage the improvement of the quality of processes and results of learning mathematics. Seeing the strategic position of geometry as described above, geometry in elementary schools needs to get the main attention from teachers, especially learning methods and approaches. On the other hand, there were indications that geometry received less attention from teachers. According to (Kahfi 1997: 31) geometry is the single most neglected field in the mathematics curriculum.

Furthermore, the teacher at SD Negeri 4 Napabalano also gave an explanation regarding learning flat shapes, especially rectangles. In general, the teacher immediately introduced the perimeter formula for a rectangle, without introducing rectangular concepts first. Even introducing the formula does not explain the concept of the formula for the perimeter of the rectangle. So that students' knowledge is only limited to understanding the formula. The learning conditions above are very concerning so that it requires action to improve and increase student understanding. What the teacher lacks here is teaching without using visual aids. The teacher thinks that teaching aids are just a hassle because the result will be the same as not using props. Even though we know that visual aids are tools to explain or demonstrate learning concepts.

In connection with the lack of application of the Realistic Mathematical Approach in learning mathematics, in this study the authors will apply the Realistic Mathematical Approach in learning, especially in learning around rectangles. In this study the material for the perimeter of the rectangle was chosen, because reviewing the KTSP curriculum that the subject of flat shapes is studied in class III semester II and the subject of flat shapes is considered difficult because it will only introduce how to determine and apply the formula for the area and perimeter of a rectangle.

METHOD

This type of research is Classroom Action Research (PTK) using the Kemmis and Mc model research design. Taggart. The subjects of this study were all students of class IIIa at SD Negeri 11 Napabalano who took part in a rectangular circuit learning. Data collection techniques were carried out by tests, interviews, observations and field notes.

RESULTS AND DISCUSSION

Before carrying out the learning activities in this study, an initial test was carried out followed by interviews with students. The results obtained are the lack of students' understanding of the concept material and the perimeter of the rectangle is caused by students studying the material. Students learn this material by receiving information and then memorizing.

Based on research (Sitti Inganah, 2003: 111) that learning by receiving information does not involve any discovery from students. Furthermore, it is said that students are only involved in internalizing (understanding) the material into their cognitive structure so that one day they can re-express or use it. But in reality most students cannot express it again, this is because students after receiving information then memorize it so that the material that has been learned is quickly forgotten. As stated by Ausubel (Sitti Inganah, 2003: 112) that through rote learning students cannot relate the information obtained to their cognitive structure, so this information cannot be deposited. In addition, students can only remember simple facts.

Based on the facts that have been stated above, a learning plan is developed that can help students understand the concept and perimeter of a rectangle through a realistic mathematical approach using visual aids. Learning through a realistic mathematical approach using teaching aids basically has four main activities, namely: (1) solving realistic problems in small groups (2) presenting the results of the discussion (3) organizing the knowledge obtained from realistic problems into the concept of the perimeter of a rectangle (4) Solving questions or other realistic problems.

Realistic problem solving activities are activities carried out at the beginning of learning. This activity is carried out as an effort to provide opportunities for students to use their intuitive knowledge to solve realistic problems. Before students solve realistic problems, students are given several explanations by the teacher regarding the subject matter to be studied which is related to realistic problems and provides Student Activity Sheets (LKS). In the presentation of the material provided, it has been prepared realistically by the teacher (researcher) which can be used as supporting material in learning. While LKS contains realistic problems that must be solved by students.

Students solve this realistic problem in small groups. They discuss and are given the opportunity to use their own way of language in solving realistic problems. They are also allowed to use the summary notes given by the teacher during the discussion. While the teacher will provide assistance if needed.

Some of the things that can be obtained from the results of research on each action is that in the first cycle of learning actions it was found that there were still many students who asked questions in solving LKS questions that involved realistic problems. For example, students always ask how to solve these problems. Many students look confused, so they feel unsure and hesitant in solving these questions. This is because students are still influenced by the previous learning model, namely solving realistic problems after understanding the concept or knowing the formula. Students also still have difficulty in determining the perimeter of a rectangle. This can be seen from the results of discussions on solving LKS questions presented by students. In their presentation, students showed several mistakes. Meanwhile, from interviews conducted with DD, information was obtained that students did not understand the circumference of a rectangle because the teacher did not use teaching aids. This is in accordance with Bruner's learning theory (Aisyah 2007: 22) that learning mathematics in elementary school, especially in the lower grades, really needs concrete objects that can be directly observed and held by students when carrying out learning activities. Therefore, the role of teaching aids in realistic mathematics learning should not be forgotten.

Another thing found in action learning cycle I is the completion of word problems related to problems in everyday life. The problem found was that students did not know the formula for solving the perimeter of a rectangle in the form of word problems. Therefore it is considered better if problem solving learning in the form of word problems is explained again by using objects around students.

Low ability students have not been active in discussion activities to solve LKS questions. They just watch and pay attention to their friends solving LKS questions. They never even asked questions even though he didn't know what his friend was talking about. Therefore students with low abilities need to get more attention compared to students with medium and high abilities.

Learning cycle II found that students had started to enjoy solving questions. In discussions they sometimes cheer together if they get the right answer. Another thing that was found in cycle II learning was solving problems in determining the length or width of a rectangle if the perimeter is known. The problem is that students cannot determine the final result in their completion. This is caused by students' lack of knowledge about multiplication and division arithmetic operations. So to overcome this problem, another time outside of class hours is determined to be used for research to guide students who are still lacking in completing division and multiplication arithmetic operations.

While the implementation of learning in cycle III the teacher looks for other teaching aids that can be used in instilling the concept of the circumference of a rectangle. The tools used are thread and rope. From the teacher's explanation with the props, it can be seen that students have started to be enthusiastic in solving the questions given. It can be seen that during the discussion in completing the LKS, none of the students looked confused and daydreaming. In contrast to the implementation of cycles I and II, there were still many students who looked confused and always asked "how do you do it, Mrs".

The next activity is presenting the results of the discussion. This activity is carried out by one student who represents the group. However, if there is work that is different from the other groups, one of the students from the other group is also welcome to present. Likewise there are things that have been presented by a student that are not clear, so other students can ask questions or provide responses.

This presentation activity is intended to explain the results of discussions that students have obtained in groups to all students in the class. Prior to the presentation, students worked in small groups to discuss realistic problem solving given by the teacher. Each group then prepares a presentation to communicate the answers found to the whole class. But when the answers found are the same as those presented by a group, so groups that have the same findings do not need a percentage.

Through this presentation it is also intended to motivate students to actively participate in solving LKS questions in groups. Because students who do presentations are appointed directly by the teacher. Therefore it is expected that all students understand what has been obtained in small group discussions. In the implementation of the first cycle, it was found that students made a presentation of the results of their discussions shyly. There are even students who can only write down the problem. From this percentage it can be said that students are less happy and enthusiastic in learning. This is because students do not understand the material being discussed. Therefore it would be better if during the discussion the teacher approached the problem group and guided them in solving the questions until they understood the meaning of the questions being discussed. In the end students can do a good presentation.

Continuing the learning activities of cycle II it was found that students were happy in conducting discussions. This can be seen from the number of students who point their fingers so that they are given the opportunity to present. With the enthusiasm of students to make presentations, students are increasingly presenting so that what is presented is better.

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so that what is being presented becomes. Furthermore, in the presentation of cycle III, it was found that students were happy and enthusiastic in making presentations. Because the percentage of student cycle II activities has shown good progress, so that the implementation of this research was carried out in only 3 cycles. Then to make it easier for students to understand abstract mathematical concepts, the teacher uses visual aids. The visual aids used are concrete so that they can be easily manipulated by students' hands so that it makes it easier for students to recognize the concept being studied. Thus students will more easily understand abstract mathematical concepts in a simpler way. Experience in direct contact with the tool will provide a kind of bond for the mathematical concepts represented by the props that are used properly.

In learning activities, students work together in groups by manipulating props, namely nail boards, unit squares and threads/rope. This teaching aid is used by students in getting to know the concept of a rectangle and determining the perimeter of a rectangle in solving LKS questions. In their activities, one student fiddles with the other student's props to write down the results found from the tool the props. This activity is also possible creating a pleasant experience for students, can also involve students physically and mentally in learning so that students can build their knowledge.

With the activities carried out by students in contact with teaching aids, students consciously interpret the mathematical patterns contained in these concrete objects. In addition, students feel that the activities carried out by fiddling with unit squares and nail boards have a playful atmosphere. Feelings of satisfaction and pride are experienced by students when students find answers from the teaching aids, so that the concept and perimeter of the rectangle can be found by students. Thus, students will more easily explain concepts and determine the perimeter of a rectangle.

Based on the results of the analysis of student responses indicated by the choice of statements through the questionnaire given, it can be concluded that learning the concept of perimeter of a rectangle with a realistic mathematical approach and teaching aids can have several impacts on students, namely students: a. Enjoys solving realistic problems, b. Encouraged to express his ideas in discussing realistic problems, c. Enjoys taking lessons around rectangles with approaches and teaching aids used by teachers in learning, d. Gaining new experiences during learning activities, e. Can apply in everyday life in determining the circumference of an object.

Based on the description above, it can be concluded that students in participating in learning around the rectangle show a positive response. They are motivated to learn, because they feel discovering mathematical concepts. This is in accordance with what was stated by Vonglasersfeld (Sitti Inganah, 2003: 128), that students must taste something from the satisfaction of mathematicians in doing mathematics, they are not expected to get it in any praise they might give

for their performance. But only knowing what has been achieved in its own conceptual construction.

CONCLUSION

Based on the results of the research it is known that learning by using spiked boards and unit squares through a realistic mathematical approach can improve students' understanding of concept material and the perimeter of a rectangle. As well as put forward several suggestions that need to be considered including For educational practitioners (teachers) who are interested in applying a realistic mathematical approach in learning mathematics, it is recommended to pay attention to the following matters: a. It is necessary to allocate time well, because discussion activities to solve realistic problems if not time-limited students will be in discussion for a long time. And with unlimited time, students will use that time for others. In addition, teachers should always monitor student discussion activities, so they know what students are doing. b. Teachers need to prepare material that is arranged realistically that students can use as a support in learning. c. In compiling realistic problems, efforts should be made not to use convoluted and long sentences. This long sentence can make it difficult for students to understand the meaning of the problem. So that they are hampered in understanding sentences. d. The formation of students in small groups, should be heterogeneous so that students can work together and help each other.

REFERENCE

- Aisyah, Nyimas. dkk. 2007. Pengembangan pembelajarn matematika SD. Jakarta: Direktorat Jendral Pendidikan tinggi, Departemen Pendidikan Nasional.
- Arikunto, Suharsimi. dkk. 2006. Penelitian tindakan kelas. Jakarta: PT Bumi Aksara.
- Cahya, Antonius. 2006. Pemahaman Dan Penyajian Konsep Matematika Secara Benar Dan Menarik. Jakarta: Depdiknas Direktorat Jendral pendidikan tinggi direktorat ketenagaan
- Darhim. 1992/1993. Workshop matematika modul 1-6. Jakarta: Depdikbud Direktorat Jendral pendidikan dasar dan menengah bagian proyek penataran guru SLTP setara D-III.
- Depdikbud. 1997. Matematika. Jakarta: Universitas Terbuka.
- . 1992/1993. Pendidikan Matematika 1. Jakarta: Depdikbud Direktorat Proyek Pembinaan Tenaga Kependidikan Tinggi Proyek Pembinaan tenaga Kependidikan.
- Depdiknas. 2003. Seminar Nasional Exchange Experience Pembelajaran MIPA Kontekstual dalam Menyongsong Implementasi KBK. Malang: Universitas Negeri Malang FMIPA.
- Desiani,R.A.N.Z. 2022.Pelatihan Matematika Realistik Sebagai Upaya Peningkatan Kemampuan Geometri Matematika Siswa SD Negeri 04 Indralaya Selatan.Vol. 3. No. 3.

- Haras.AH.2021. Pengembangan LIT Topik-topik Keliling dan Luas Persegi Panjang Berbasis Pendekatan Realistic Mathematic Education di Sekolah Dasar. Vol. 5.No. 1.
- Herman, Tatang. 2001. Pengembangan Profesionalisme Guru Melalui Kegiatan Kolaborasi Penelitian Tindakan. Jakarta: Japan International Cooperation Agency Directorate General of Highereducation Departement of National Education.
- Shavira. A.R. 2021. Alat Peraga ABD Ajaib Guna Memahami Konsep Luas dan Keliling. Bangun Datar Berbasis Etnomatematika. Vol.1. No. 1.
- Kahfi, M.S. 1997. Membenahi Pembelajaran Geometri di Sekolah melalui Teori Van Hiele. *Karmath, III (2): 31.*
- Kennedy, LM dan Tipps, S. 1994. *Guildey Children`s Learning of Mathematics.* New York: Wes Pablshy Company.
- Kurikulum tingkat satuan pendidikan (KTSP). 2006. Mata pelajaran matematika untuk tingkat SD/MI. Jakarta: Depdiknas.
- Latri. 2004. Pembelajaran bangun ruang secara konstruktivis dengan menggunakan alat peraga di kelas IV SDN 10 Watampone. Tesis. Malang: Universitas Negeri Malang program pasca sarjana program studi pendidikan matematika SD.
- Moleong, L. 2000. *Metodologi Penelitian Kualitatif.* Bandung: PT. Remaja Rosdakarya.
- Muhsetyo, Gatot dkk. 2005, *Pembelajaran Matematika SD.* Jakarta: Universitas Terbuka Departemen Pendidikan Nasional.
- Mulyana, 2001. *Rahasia Matematika untuk SD kelas 4, 5, dan 6.* Surabaya: Edutama mulya.
- Pitajeng. 2006. *Pembelajaran Matematika Yang Menyenangkan.* Jakarta: Departemen Pendidikan Nasional Direktorat Jenderal Pendidikan Tinggi.
- Ruseffendi, dkk. 1992. *Pendidikan matematika 3 modul 1-9.* Jakarta: Depdikbud Proyek Pembinaan Tenaga Kependidikan Tinggi.
- Siti Inganah. 2003. *Model Pembelajaran Segiempat dengan Pendekatan Realistik Pada Siswa Kelas II SLTP Negeri 3 Batu.* Tesis. Malang: Universitas Negeri Malang.
- Soedjadi, R. 1991. *Evaluasi Hasil Belajar dalam rangka Meningkatkan Pendidikan.* Jakarta: Media Pendidikan.
- Sri Subarinah. 2006. *Inovasi Pembelajaran Matematika Sekolah Dasar.* Mataram: Departemen pendidikan Nasional, direktorat Jenderal Pendidikan Tinggi direktorat Ketenagaan.
- Suherman, Erman, dkk. 2006. *Strategi pembelajaran matematika kontemporer.* Bandung: JICA Jurusan Pendidikan matematika FMIPA Universitas Pendidikan Indonesia.
- Tarigan, Daitin. 2006. *Pembelajaran Matematika Realistik.* Jakarta: Depdiknas Direktorat Jenderal Pendidikan Tinggi Direktorat Ketenagaan.
- Wardani, I.G.A.K. 2005. *Penelitian Tindakan Kelas.* Jakarta: PT Bumi Aksara.