**THE IMPLEMENTATION OF USING ABACUS MEDIA TO ENHANCE MATHEMATICS SKILLS AND INTEREST IN FIRST GRADE ELEMENTARY STUDENTS OF SDN 060857 MEDAN TEMBUNG**

**Rindi Puspita1 Mandra Saragih2,Siti Hadijah3**

1,2,Muhammadiyah University of North Sumatra, 3SDN 060857 Medan Tembung

1 rindipuspita94430@program.belajar.id; 2 [mandrasaragih@umsu.ac.id](mailto:mandrasaragih@umsu.ac.id); 3sitiposos@gmail.com

**Abstract**

The objective of this study is to determine the implementation of using abacus in Mathematic especially in addition and subtraction at first grade elementary school. This research using Classroom Action Research that has 2 cycles and the researchers also made pre-test before did the cycles. The subject of this research is the subject of this research is the first grade students of Medan Tembung state 060857 elementary school totaling 24 students. The results of this research found 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness, but the average was improve. The average was 82,5.

Keywords: Abacus, mathematics, elementary school

**Introduction**

Mathematics is one of the most important subjects. Mathematics is a subject of numbers, shapes, data, measurements and also logical activities. It has a huge scope in every field of our life, such as medicine, engineering, finance, natural science, economics, etc. Researcher Kurniawan (2017) stated that "education prepares and grows students or individual humans whose process takes place continuously from birth until they die." Mathematics is one of the most important parts of education. As Tampubolon and Tamba (2022) stated that through learning mathematics, students are expected to develop the ability to think critically, systematically, logically, and creatively. On Elementary school mathematics is the subject that has 5 times a week. Each times has 35 minutes, so mathematics lesson is one of the important lesson in the school. In our environmental mathematics also needed to have interaction with other people such as interaction between seller and buyer. So as students, they have basic in mathematics to help them in their daily activity.

Abacus has been considered as one of the most significant tools used for teaching and learning of mathematics among primary school mathematics teachers since it helps in spurring better performance in mathematics. Kaput (2007) described Abacus as a wood frame mathematical tool is composed of columns of movable beads has been used for arithmetic calculations throughout Asia. In the Middle East Abacus is described as an “abax”, a Greek word for tray or table that originated from the Semitic word “abq”, meaning “dust” or sand or “earth” (Jenni and Pumfrey, 2007). Stigler, Chalip and Miller (2006) described Abacus as a simple device for performing arithmetic function. A method used by Chinese, Japanese, and Koreans to improve mathematical skills. In Indonesia there are some types of abacus. The researchers using basic abacus in the first grade elementary school, so the students can easily using abacus in mathematic lesson.

Some older researchers showed that abacus has an effect to increase students’ ability in mathematics especially counting numbers. Suryani Aulia Putri (2024) in her research the effect of using abacus of the first grade in State Elementary school 09 in Belakang Balok found that used abacus has an effect than did not use abacus in mathematics lesson. Tobias Andhala Omenda (2018) in his research Effective use of Abacus in the Teaching and Learning of Mathematics among class three Teachers in Public Primary Schools in Kasipul Division Rachuonyo South Sub County, Kenya found that abacus made learners become accurate in solving mathematical problems which was supported by teachers. There are numerous benefits of using Abacus in teaching mathematics as indicated by the findings. Juliana & Lester C. Hao (2017) in their research Effects of Using the Japanese Abacus Method upon the Addition and Multiplication Performance of Grade 3 Indonesian Students found that relation between abacus learners and their performance in problem solving may be an insightful topic for future study.

The Students in first grade at Medan Tembung state 060857 elementary school got difficult when counting numbers that more than 10 because of They used their finger when counting the numbers. They have 10 fingers so if they counted numbers more than 10, they got difficult and felt confused.

The abacus not only increases the ability of children in performing mathematics calculations, but also develops memory effectively (Gera and Kaur, 2014). In this research, the researchers wanted to observed and saw how far abacus training can help students to be accurate and speedy in performing addition and multiplication. Based on the problem above the researchers would use abacus to help the students increase their mathematics skill especially addition and subtraction.

**Research Method**

This research is Classroom Action Research, so this research was carried out in several cycles. There are 4 steps in the procedure for implementing classroom action research, namely: (Arikunto 2019:42) (1) Planning; (2) Implementation of Actions; (3) Observation; (4) Reflection.

Planning is the first step to prepare the teaching designed by the researchers. In this case the researchers used abacus in mathematics lesson especially in addition and subtraction. Implementation of actions the researchers asked students to do some mathematics questions about addition and subtraction used abacus. After that the researchers observed the students’ result in mathematics when they used abacus and the last the researchers analyze students' scores in mathematics tests conducted at the end of these studies.

This Classroom Action Research was planned in two cycles, each cycle meeting twice. The subjects in this research were 24 students in the first grade for the 2024/2025 academic year. And the object of this research is the results of students' mathematics learning on counting to improve it. The research variable is the learning outcomes of students in learning simple fractions and the indicators in this research are the scores obtained from test results taken from each student's activity from the results of observations in each cycle. The tools used to collect data in this research are tests and observations.

**Findings**

The researchers had one month to conduct the research in SDN 060857. The researchers observed students' skills in mathematics. Firstly, the researchers observed the classroom situation for two weeks in August 2024. During those weeks, the results of the observation showed that the students' ability in addition and subtraction 1st grade elementary school were low. Document analysis was also conducted to determine the students’ addition and subtraction skills in a pre-test. It was to support the results of observations so that they are more accurate. Before implementing the abacus media in the class, the researchers accumulated the document analysis results of the previous addition and subtraction skills and gave a pretest. Following the observations and the document analysis, the conversation text pre -test was given to 24 students. The average pre-test score is 55,83 of the 24 students the score comes in the poor category. After gave the pre-test the researchers asked the students to used abacus to help them do some mathematics questions.

Table 1. Results Scores and Values of Students in Pre-test

|  |  |  |  |
| --- | --- | --- | --- |
| No | Students’ code | Score | Information |
| 1 | PD1 |  | Not complete |
| 2 | PD2 | 80 | Complete |
| 3 | PD3 | 80 | Complete |
| 4 | PD4 | 40 | Not complete |
| 5 | PD5 | 30 | Not complete |
| 6 | PD6 | 40 | Not complete |
| 7 | PD7 | 40 | Not complete |
| 8 | PD8 | 40 | Not complete |
| 9 | PD9 | 40 | Not complete |
| 10 | PD10 | 60 | Not complete |
| 11 | PD11 | 20 | Not complete |
| 12 | PD12 | 60 | Not complete |
| 13 | PD13 | 80 | Complete |
| 14 | PD14 | 80 | Complete |
| 15 | PD15 | 40 | Not complete |
| 16 | PD16 | 50 | Not complete |
| 17 | PD17 | 60 | Not complete |
| 18 | PD18 | 70 | Not complete |
| 19 | PD19 | 60 | Not complete |
| 20 | PD20 | 40 | Not complete |
| 21 | PD21 | 80 | Complete |
| 22 | PD22 | 80 | Complete |
| 23 | PD23 | 40 | Not complete |
| 24 | PD24 | 20 | Not complete |
| Result | | 1340 |  |
| Average | | 55,83 |  |

From the table 1 the students’ ability in mathematics still low. The result showed there were 24 students did pre-test, the result were 6 (25%) students have reached the level of learning completeness, while 18 people (75%) have not reached the level of learning completeness. The average students learning outcome score is 55,83. The difficulties do mathematics questions in addition and subtraction have reached the level of learning completeness are as follows:

Table 2. Difficulties Encountered in Learning

|  |  |  |
| --- | --- | --- |
| No | Students’ difficulties | Solution |
| 1 | Students focus on their 10 finger | The teacher asked students to use abacus |
| 2 | Students did not got confused when count numbers more than 10 | The teacher teach student one by one to do mathematics questions that more than 10 |
| 3 | Students do not understand between addition and subtraction | The teacher explain the differences between addition and subtraction to the students |

**Cycle I**

In cycle I teacher explained how to used abacus in mathematics especially in addition and subtraction to the students. After that teacher gave some questions to students which is students used abacus to answers the questions. In this cycle teacher guide the students to answer the questions used abacus.

This is the result score from the students using abacus:

Table 3. Results Scores and Values of Students using Abacus

|  |  |  |  |
| --- | --- | --- | --- |
| No | Students’ code | Score | Information |
| 1 | PD1 | 75 | Complete |
| 2 | PD2 | 90 | Complete |
| 3 | PD3 | 90 | Complete |
| 4 | PD4 | 75 | Complete |
| 5 | PD5 | 70 | Complete |
| 6 | PD6 | 75 | Complete |
| 7 | PD7 | 75 | Complete |
| 8 | PD8 | 75 | Complete |
| 9 | PD9 | 75 | Complete |
| 10 | PD10 | 80 | Complete |
| 11 | PD11 | 60 | Not complete |
| 12 | PD12 | 85 | Complete |
| 13 | PD13 | 90 | Complete |
| 14 | PD14 | 90 | Complete |
| 15 | PD15 | 75 | Complete |
| 16 | PD16 | 85 | Complete |
| 17 | PD17 | 85 | Complete |
| 18 | PD18 | 90 | Complete |
| 19 | PD19 | 85 | Complete |
| 20 | PD20 | 75 | Complete |
| 21 | PD21 | 90 | Complete |
| 22 | PD22 | 90 | Complete |
| 23 | PD23 | 80 | Complete |
| 24 | PD24 | 60 | Not complete |
| Result | | 1920 |  |
| Average | | 80 |  |

From the table above there were improvement the students’ score. On pre-test showed the average 55,83 and 6 (25%) students have reached the level of learning completeness, while 18 people (75%) have not reached the level of learning completeness. On the cycle I there were 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness and the average was 80. So in the cycle I students’ skill in mathematics were improve when used abacus as media to help them in addition and subtraction on mathematics lesson.

**Cycle II**

In cycle II teacher did not explained how to used abacus in mathematics. Teacher directly asked the students to answer the questions without teacher’s guidance and gave bigger number in the questions. This is the table of the result in cycle II.

Table 4. Results Scores and Values of Students using Abacus without teacher’s guidance

|  |  |  |  |
| --- | --- | --- | --- |
| No | Students’ code | Score | Information |
| 1 | PD1 | 80 | Complete |
| 2 | PD2 | 90 | Complete |
| 3 | PD3 | 90 | Complete |
| 4 | PD4 | 75 | Complete |
| 5 | PD5 | 75 | Complete |
| 6 | PD6 | 75 | Complete |
| 7 | PD7 | 75 | Complete |
| 8 | PD8 | 80 | Complete |
| 9 | PD9 | 75 | Complete |
| 10 | PD10 | 80 | Complete |
| 11 | PD11 | 70 | Not complete |
| 12 | PD12 | 85 | Complete |
| 13 | PD13 | 100 | Complete |
| 14 | PD14 | 90 | Complete |
| 15 | PD15 | 80 | Complete |
| 16 | PD16 | 85 | Complete |
| 17 | PD17 | 85 | Complete |
| 18 | PD18 | 90 | Complete |
| 19 | PD19 | 85 | Complete |
| 20 | PD20 | 80 | Complete |
| 21 | PD21 | 100 | Complete |
| 22 | PD22 | 90 | Complete |
| 23 | PD23 | 80 | Complete |
| 24 | PD24 | 65 | Not complete |
| Result | | 1980 |  |
| Average | | 82,5 |  |

From the table above there were improvement the students’ score. On cycle I showed the average 80 and 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness. On the cycle II there were 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness, but the average was improve. The average was 82,5. So in the cycle I students’ mathematics’ skill were improve when used abacus as media to help them in addition and subtraction on mathematics lesson

**Conclusion**

The conclusion used abacus to increase first grade mathematics skill especially on addition and subtraction found that more than 90% students have reached the level of learning completeness. Before used abacus the researchers made pre-test that found 6 (25%) students have reached the level of learning completeness, while 18 people (75%) have not reached the level of learning completeness. The average students learning outcome score is 55,83. After that the researchers used abacus in cycle I and cycle II. In cycle I, found 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness and the average was 80. In cycle II there were 22 (91,66%) students have reached the level of learning completeness, while 2 people (8,33%) have not reached the level of learning completeness, but the average was improve. The average was 82,5. So using abacus in mathematics lesson especially on addition and subtraction can increase student ability in mathematics skill.

**References**

Arikunto, S. 2019. Dasar - Dasar Evaluasi Pendidikan. Jakarta:Bumi Aksara

Gera, M., & Kaur, J. (2014). International Journal of Multidisciplinary Approach and Studies Theme-Role of Abacus learning in Mathematics. International Journal of Multidisciplinary Approach & Studies, 1(5). www.alcula.com

Jenni, B. & Pumfrey, L. (2007). Adding with Abacus.47-27987. US. Published Thesis, Chicago University.

Juliana., Lester C. Hao.(2017). Effects of Using The Japanese Abacus Method upon The Addition and Multiplication Performance of Grade 3 Indonesian Students. International Journal of Indonesian Education and Teaching. Vol. 2, No. 1, January 2018

Kaput, J. (2007). Technology becoming infrastructural in mathematics education. Models and modelling as foundations for future in mathematics education. Mahwah, NJ: Lawrrence Eribaum. Free Journal Research .www.globalthics.net/library.

Kurniawan, S. 2017. *Pendidikan Karakter: Konsepsi & Implementasinya secara Terpadu di Lingkungan Keluarga, Sekolah, Perguruan Tinggi, dan Masyarakat.* Yogyakarta: ArRuzz Media.

Omenda, Tobias Andhala. (2018). Effective use of Abacus in the Teaching and Learning of Mathematics among class three Teachers in Public Primary Schools in Kasipul Division Rachuonyo South Sub County, Kenya. Educational Technology. Elixir Edu. Tech. 120 (2018) 51376-51386

Putri, Suryani Aulia. (2024). *Pengaruh Penggunaan Sempoa Terhadap Kemampuan Berhitung Pada Anak Kelas 1 SDN 09 Belakang Balok*. Causalita: Journal of Psychology. Vol. 2 No. 1 Tahun 2024, hal 169-174

Stigler J., Chalip, M. & Miller, K. (1986). Consequences of Skill. The case of Abacus Training in Taiwan. American Journal of Education. Vol. 194, No. 4 297- 367.

Tampubolon, J., & Tamba, E. F. (2022). The Effect of Accompaniment Music on the Concentration and Learning Outcomes of Grade VIII Students in Alpha Omega Education Tutoring Center. Journal of Classroom Action Research, 1(2), 16–22. https://doi.org/10.52622/jcar.v1i2.92