



CLASSROOM ACTION RESEARCH TO IMPROVE STUDENTS' NUMERACY SKILLS ON INTEGER USING *MANIK-MANIK* MEDIA

Yohanis Ndapa Deda^{1*}, Lailin Hijriani², & Ayu Trifosa Alnabe³
^{1,2,3}Universitas Timor, Indonesia

*Corresponding Author E-mail: yndapadeda@unimor.ac.id

Abstract

This study aims to improve students' numeracy literacy skills on integer operation material using Manik-Manik media. The method used is Classroom Action Research (CAR). Research is carried out in two cycles, and each process consists of three meetings, with stages: planning/preparation of actions, implementation of activities, observation, and reflection. Data collection techniques using observation techniques (teachers and students), learning outcomes tests, and documentation. Based on the results of the research on 25 students, it is known that there was increasing in student learning outcomes from before the action, Cycle I and Cycle II. This is evidenced by the post-test value that was carried out in cycle I, which showed an average value of 59.4, and then the increase in cycle II with an average value of 90.8. The data analysis techniques used are data analysis of observations of teachers and students and analysis of test result data in the form of classical completeness. Based on the research on integer operation material, it was concluded that learning by using Manik-Manik can improve students' mathematics learning outcomes. Thus, using Manik-Manik media can improve students' numeracy literacy skills on integer operation materials.

Keywords:

Integer, Manik-Manik Media, Numeration Literacy, CAR.

INTRODUCTION

Numeracy literacy is considered very important because we need to understand the information in social life, for example, regarding health and hygiene. Because all of this information is usually expressed in numerical or graphic form, therefore inevitably, we must be able to understand numeracy literacy. Numeracy literacy is the knowledge and ability to use various numbers and symbols related to basic mathematics to solve practical problems in multiple contexts of everyday life and analyze information displayed in various forms (graphs, tables, charts, and so on), then use the interpretation of the results of the analysis to predict and make decisions. In simple terms, numeracy can be interpreted as the ability to apply number concepts and calculation operation skills in everyday life.

Indonesian students' basic literacy and numeracy competencies at the primary and secondary education levels have not reached the minimum standard. This was revealed from the results of the first National Assessment in 2021, which was used as an initial database to photograph the quality of education from the school, regional, and national levels. The results of this National Assessment will be an education report card to ensure that education improvements focus on improving learning quality and narrowing gaps.

Literacy culture in Indonesia is also a fascinating issue to discuss. Given that the literacy culture in Indonesia is still low, not yet cultured, and not ingrained among the community. During soaring popular culture, books have never been a top priority again. Even people absorb the culture of speaking and listening more quickly than reading and pouring it into written form. Indonesian society is still dominated by oral communication culture or speech culture. People prefer watching cell phones with status updates and following television broadcasts rather than reading (Suswandari, 2018).

The solution that researchers can offer to improve student numeracy literacy is to familiarize students with reading and then understand students who must be supported by learning aids, commonly referred to as media. One of the learning media used is *manik-manik* which can

make it easier for students to understand the abstract context of mathematics. Learning media will make students more active and interested in following the learning process to increase student enthusiasm for learning. One engaging media is the *manik-manik* media as a tool in integer operation material. They learn using *manik-manik* through play activities according to the teacher's direction. The media is used to improve the ability to calculate the results of addition and subtraction optimally; children can understand the concept of addition and subtraction, so children are motivated to do math problems in addition and subtraction material (Badhi Katarina Maria, Sa'o, 2020).

Based on the results of initial observations made on January 13, 2023, at one of the private elementary schools in Timor Tengah Utara (TTU), by interviewing mathematics teachers and asking about developments regarding children's concept understanding of integer material, namely children's understanding of the material is still very low where children find it challenging to operate negative integers, primarily if two signs (negative and positive) are located at once in the problem. Previous research was conducted (Perdana and Suswandari 2021), which showed that the existence of Numeracy Literacy in Mathematics Learning for Upper-Grade Elementary School Students can increase the numeracy literacy of students who are still very low (Siska, Safei, and Sulasteri 2021). This indicates that using *manik-manik* media can improve students' mathematical abilities, count on basic operations (integers), increase student learning motivation, and improve students' skills in learning mathematics. This study aimed to improve students' numeracy literacy skills on integer operation material using *manik-manik* media.

METHOD

The method used in this study is Classroom Action Research (CAR) model by Kemmis and McTaggart. This research is a technique that ensures that learning managed by teachers improves continuously through each improvement. In CAR, researchers use actions consisting of two cycles while the steps carried out are planned before researchers take action. At this planning stage, the first researcher prepared the learning tools to implement measures: syllabus, lesson plans, teaching materials, test questions, *manik-manik* media, and observation sheets.

Then, continue to the stage of implementation (acting), before the researcher teaches on the first day, the researcher gives pre-test questions to students. After that, discuss together with students. On the second day, the researcher teaches integer operation material using *manik-manik* media the contextual approach, and during the learning activities, the researcher carried out learning with three types of activities, namely preliminary activities, core, and cover.

On the third or last day, the researcher reviewed the material, after which the researcher gave a post-test question to the students so that the researcher knew the extent of the student's abilities for three days. Then, at the observation stage, during learning activities in the classroom, to determine the success of actions, the teacher observes the researcher, and the researcher keeps students. The last stage of reflection is that several things must be considered and improved to improve cycle two.

Some reviews obtained from cycle one are lack of teacher guidance in controlling students to complete Worksheet Student (WS), lack of teacher guidance in making conclusions, students still lack understanding and difficulty distinguishing between operations and number values, students still did not understand the problems in WS, lack of experience and attention during the learning process so that students could not make conclusions from the material that has been learned, and lack of motivation for students so noisy during learning activities. So, the researcher replanned by looking at the existing reflections so that the researcher could improve every feeling in cycle two. Therefore, in this cycle, students were declared classically complete.

This CAR was carried out in class VI at one of the elementary private schools in the TTU district, with 25 students consisting of 13 boys and 12 girls. The data collection techniques used are observation and tests. It can be analyzed further, and cycle tests in the form of post-tests are carried out at the end of each cycle to get scores from each student. So that classical completeness scores can be known, the data analysis in this study was sourced from teacher activities, student activities, and numeracy skills (class completeness)

FINDINGS AND DISCUSSION

This CAR consists of two cycles, namely cycle 1 and cycle 2. The description of each cycle consisting of the stages of pre-planning, implementation, observation, and reflection is as follows. The following Table 1 are the results of the final tests of cycles 1 and 2.

Tabel 1. Classical completeness of each cycle

No	Subject	Cycle 1	Cycle 2
		Test Score	Test Score
1	AHR	57	100
2	AN	64	100
3	AL	60	100
4	CRL	82	100
5	DS	80	93
6	ES	62	100
7	JK	13	93
8	JA	48	88
9	JT	35	50
10	JK	75	100
11	KSK	97	100
12	MAM	71	57
	Average	62	90

Cycle I

The implementation of cycle I begin with the planning stage, implementation of lesson plan (LP) following the syllabus, preparing learning facilities and infrastructure such as *manik-manik* media, preparing WS for each meeting, making observation sheets to see how teaching and learning conditions in class during the learning process take place. The *manik-manik* media to discuss the addition and subtraction of positive numbers with positive and vice versa. The material taught at the first meeting was integer operations.

At the observation stage, the researcher observes the implementation of actions. The results of this observation help see the development or increase in teacher and student activities in carrying out learning and the shortcomings that occur in the learning process. Reflection in the first cycle is intended to determine the weaknesses experienced during the learning process in cycle 1, and then improvements are made in the next cycle. The stages carried out in this first cycle are:

Planning Phase

Before carrying out actions, at this planning stage, researchers first prepare learning tools to be used in implementing activities. These devices include (1) Syllabus. The syllabus prepared by the school includes core competencies, essential competencies, subject matter, learning activities, time allocation, and learning resources related to integer material; (2) Implementation of LP. Researchers compile this LP with its basic competence. Explain and apply positive and negative integer operations, and read and understand positive and negative integer symbols. At the same time, the media used in learning researchers is *manik-manik*; (3) Teaching Materials about integer; (4) Test Questions. Test questions used by researchers to know student learning outcomes are written tests in the form of descriptions with some five-number questions. This test is given to students at the end of the cycle, and this test is done by students individually; and (5) Observation Sheet or Observation. Observation is collecting data by observing and recording events seen when conducting research. The researcher carries out this operation simultaneously with the implementation of the action.

Action Implementation Phase

The implementation of actions used by researchers in this study is to use *manik-manik* media, which are as follows: (1) Introductory Activities. Researchers gave greetings, prayed, and checked students' attendance in this preliminary activity. Afterward, the researcher conveyed the objectives and benefits of learning about integer material and gave students a pre-test; (2) Core

Activities. In this core activity, researchers began to take action by giving and explaining integer material using *manik-manik* media. Still, before being given the material on the first day and treatment students, researchers gave pre-test questions first to measure students' initial abilities; then, on the second day, researchers began to provide material and explain integer operation material using *manik-manik* media. On the last day, researchers reviewed the material before being given post-test questions, after which students worked on the questions given individually.

Cycle I pre-test questions are given to students before explaining the material and the treatment of teaching aids so that researchers can determine the extent of students' understanding of integer operation material. In Table 1, it can be seen that students have not been able to use mathematical solutions correctly, namely, using known, questioned, and resolved sentences. Hence, there needs to be guidance and direction from researchers to students so that students can understand and get used to using these methods.

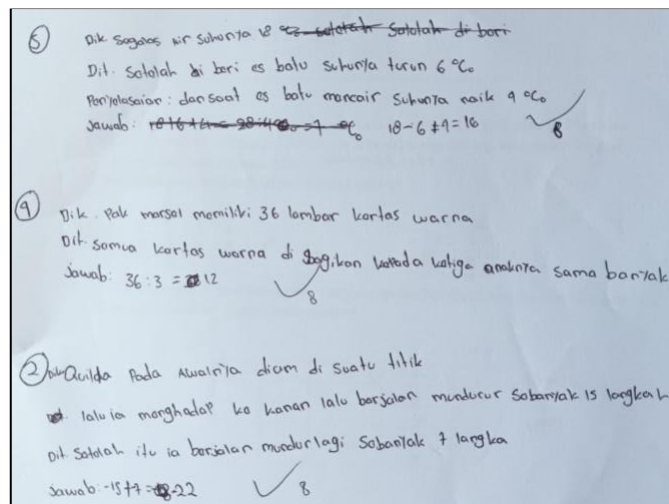


Figure 2. Sample answers of First Cycle Post-Test Students

Table 1 shows that from 12 students, there are 5 students with complete status, and remain 7 students are incomplete. Based on the pre-test results, researchers provide treatment with learning using bead media to make it easier for students to understand basic operation concepts. The purpose of understanding basic concepts is important to make it easier to work on numeracy literacy problems properly and correctly.

The post-test questions in cycle I are given to students at the end of the process so that researchers can find out the extent of the development of understanding the material and the use of media carried out by students. In Figure 2 above, it can be seen that students are not careful in solving the questions given, so there is an error in the last number (number 5) where students do not understand the questions, so they are still wrong at the solving stage.

2. Hari ini siswa kelas VI SD GMT 4 KEFAMENANU sedang memilih ketua kelas. Di dalam kelas terdapat 24 orang siswa seperti yang ada pada gambar dan calon ketua kelas yang terpilih yaitu Budi, Kiki, dan Samuel.

Hasil ketua kelas dituliskan dalam bentuk turus.

Nama	Jumlah suara
Budi	III
Kiki	IIII
Samuel	II

Iman merasa ada yang salah dengan hasil hitungan pemilihan. Setujukah kalian dengan pernyataan Iman? Jelaskan!

Figure 3. Sample Questions of WS in Cycle I

The WS question in cycle one is given to students when they finish providing material and

treatment in the form of *manik-manik* media for students in each process so that researchers can find out the students' understanding of the material and the use of media by students. The picture above is a practice question that each student must complete, and students expected to do the questions are given carefully. The priority in this question is the way students think critically and provide logical and reasonable reasons so that students can solve the above problems.

Based on the table above, classical completeness in cycle I is declared incomplete. What causes students to be insufficient in cycle 1 is students who still do not understand and are not careful in doing the questions given; some students are still wrong in solving questions that have a combination of positive and negative numbers.

Based on the observations of teacher and student activities and the achievements of KKM, it can be concluded that the learning process using *manik-manik* media can improve students' numeracy literacy skills on integer operation material for grade VI students of one of the elementary private schools in TTU. In line with the discussion above, learning using *manik-manik* media is considered successful due to increased student grades, active students during learning, and responsibility for individual tasks in the learning process, both in group learning and as a whole. Closing Activities, researchers give tasks to students, and researchers deliver lesson plans at the next meeting and then end with prayer.

Observation Phase

After the learning activities in the classroom to determine the success of the actions taken, the researcher first looks at the observation data of student and teacher activities. Secondly, the test result data was given to students at the end of Cycle I learning. At this meeting, students discussed the addition and subtraction of positive integers with positive and vice versa; researchers provide perceptions related to the material, namely the addition and subtraction of integers, and then researchers inform today's subject matter about the concept of operations to calculate addition and subtraction of positive integers with positive or negative numbers with negative. The results of the research carried out in cycle 1 are as follows:

Teacher's Observation

Based on the observation of teacher activity in the first cycle of teacher activity with an interval of 4.5 is in the good category. The results of observations of teacher activities in learning mathematics integer operation material using *manik-manik* media in grade VI students of the elementary private school in *Kefamenanu* showed that in the first cycle during the researcher's teaching, the homeroom teacher VI observed the researcher's activities during the learning activity with various notes given to the researcher, namely the lack of motivation to students during learning, lack of providing conclusions for students on teaching materials, and lack of monitoring carried out by researchers on student learning progress during the learning process so that the interval is 4.5

Student Observation

Based on the observation of student activity in the first cycle of student activity with an interval of 4.4 with good categories. The results of observing student activities in learning mathematics integer operation material using *manik-manik* media in grade VI students of one of the private elementary schools in *Kefamenanu* showed that in the first cycle, researchers explained and gave directions related to the material and the use of the media to students. Some students understood faster, but some students did not understand due to students' lack of attention to the teacher at the time of delivery material, the lack of student skills in using *manik-manik* media, the lack of student order when following the learning process, and the lack of student ability to apply *manik-manik* media to the questions given so that the acquisition of student activity intervals in the first cycle is 4.4.

Reflection Stage

Based on data analysis on the results of the first cycle test, nine people achieved individual completeness with a classical completeness percentage of 36% that had not reached the success indicator (75%). After researchers discussed with research partners, several things are still lacking and need to be considered and improved, namely: (i) Lack of teacher guidance (researchers) in

controlling students to complete WS; (ii) Lack of guidance of teachers (researchers) in making conclusions; (iii) some students still lack understanding and find it difficult to distinguish between operations and number values, (iv) Some students still do not understand the questions in WS, (v) Lack of understanding of students so that students cannot make conclusions from the material that has been learned; and (vi) Motivate students not to make noise during learning activities.

From some of the reflections above that have been mentioned, there have been improvements in WS carried out by researchers as follows.

3. Seorang pedagang Salome membutuhkan modal sebesar Rp. 800.000 untuk sekali berdagang Salome. Saat itu ia mengalami kerugian sebesar Rp 300.000, maka berapa jumlah uang yang ia dapatkan pada hari itu?

Figure 4. Sample question of WS after revision

Figure 4 shows the researcher tried to improve WS in cycle one because, in the previous WS, students did not understand and were less careful; then, in this WS improvement for the second cycle, the researcher simplified the meaning of the WS questions and before the WS questions were given in this second cycle, the researcher also explained the purpose of each question, then the researcher also guided and directed each child to solve the questions given.

Cycle II

The implementation of cycle II begins with the planning stage, implementation of LP following the syllabus, preparing learning facilities and infrastructure such as *manik-manik* media, preparing WS for each meeting, and making observation sheets to see how teaching and learning conditions in class during the learning process take place. The action in cycle II is carried out in 3 meetings and ends with the post-test cycle II. In this action, students use *manik-manik* media to discuss the addition and subtraction of positive numbers with positive and vice versa. The material taught at the first meeting was integer operations.

At the observation stage, the researcher observes the implementation of actions. The results of this observation help see the development or increase in teacher and student activities in carrying out learning and the shortcomings that occur in the learning process. The stages carried out in this second cycle are:

Planning Phase

Before the researcher replans the actions to be carried out following the results of the first cycle reflection, at the planning stage of this second cycle, the researcher first revises the learning tools to implement actions. These devices include (1) Syllabus. The syllabus prepared by the school includes core competencies, essential competencies, subject matter, learning activities, time allocation, and learning resources related to integer material; (2) Implementation LP. Researchers compile this LP with its basic competence. Explain and apply positive and negative integer operations, and read and understand positive and negative integer symbols. At the same time, the media used in learning that researchers use *manik-manik* media; (3) Teaching Materials. Matter: integer; (4) Test Questions. Test questions used by researchers to know student learning outcomes are written tests in the form of descriptions with some five-number questions. This test is given to students at the end of the cycle, and this test is done by students individually; and (5) Observation Sheet or Observation. Observation is collecting data by observing and recording events seen when conducting research. The researcher carries out this operation simultaneously with the implementation of the action.

Action Implementation

The implementation of actions used by researchers in this study is to use *manik-manik* media, which are as follows: (1) Introductory Activities. Researchers gave greetings, prayed, and checked students' attendance in this preliminary activity. Afterward, the researcher conveyed the objectives and benefits of learning about integer material and gave students a pre-test; (2) Core Activities. In this core activity, researchers began to take action by giving and explaining integer material using *manik-manik* media. Still, before being given the material on the first day and treatment students, researchers gave pre-test questions first to measure students' initial abilities;

then, on the second day, researchers began to provide material and explain integer operation material using *manik-manik* media; the researcher also explained to students the difference between the value of a number and the operation of digits because, in the first cycle, there were still many students who found it difficult to distinguish this. After that, the researcher gives WS questions to be done by students with guidance and control from researchers so that students can easily understand and solve these problems, and then, the last teacher guides students in making conclusions about the material learned today. On the previous day, researchers reviewed the material before being given post-test questions, after which students worked on the questions given individually. In the second cycle, researchers do the same thing as cycle one. Still, researchers guide students not to make noise during the learning process and focus more on hearing the material so that there are improvements in the planning stage, so this cycle is declared victorious and meets success indicators. Of 9 students who completed cycle one 22 or 88% students complete after post-test in cycle 2.

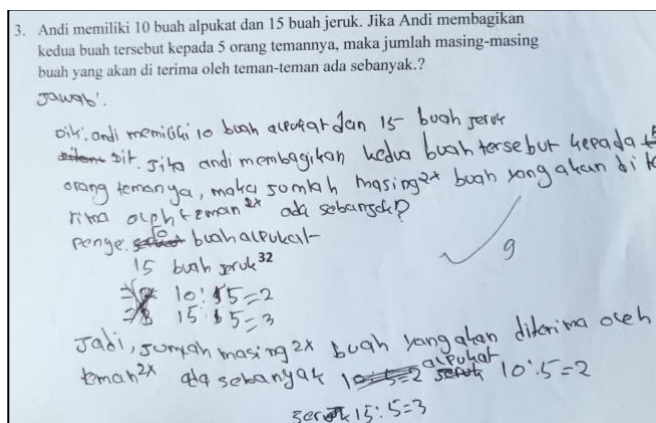


Figure 5. Sample Answers of Students of Pre-Test Cycle II

Cycle II pre-test questions are given to students before explaining the material and the treatment of teaching aids so that researchers can determine the extent of students' understanding of integer operation material. In the picture above, it can be seen that students already understand and can use how to solve mathematics correctly, so students need more practice to sharpen their abilities.

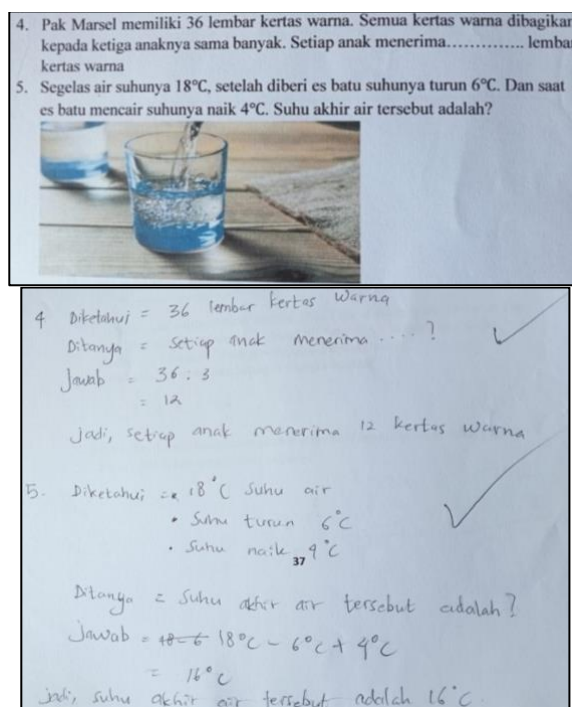


Figure 6 Sampel Answers of Student in the Post-Test Cycle II

The post-test questions in cycle II are given to students at the end of the cycle so that researchers can find out the extent of the development of understanding the material and the use of media carried out by students. In the picture above, it can be seen that students already understand and are able and thorough in solving the questions given so that students can answer each question correctly. Students can work on post-test questions because there are similarities in the problems on the LKS. The results of this study show that by often working on similar problems, students show improvements in numeracy literacy skills. We can see the results of the cycle 2 post-test in Table 1, which is 90 greater than the average in the cycle 1 post-test, which is 60. The following figure is an example of a problem on the LKS that students did before the cycle 2 post-test.

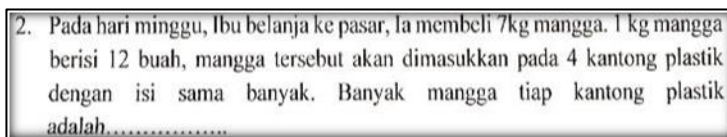


Figure 7 sample Questions of WS in Cycle II

The WS question in cycle II is given to students when they finish providing material and treatment in the form of *manik-manik* media for students in each cycle so that researchers can find out the student's understanding of the material and the use of media. The picture above is a practice question that each student must complete, and students are expected to do the questions given carefully. The problem's priority is how students think critically and how mathematical concepts solve the above issues.

After more than a month, researchers conducted another post-test on students to measure the extent of memory and understanding of concepts possessed by students to integer operation material. The final results were obtained as follows. From the second post-test of the cycle, it is clear that students understand the material and that their understanding of the concepts is excellent, so the final score is 100% complete.

Based on the fact that classical completeness in cycle II students complete classically. What causes students to complete cycle II is that students are more focused and careful in answering the questions; some students already understand the addition and subtraction of positive and negative numbers. However, some students are not cautious in answering the questions, so there are students' answers that are not right, and some are wrong in answering the questions given.

Based on the results of observations of teacher and student activities and the achievements of KKM, it can be concluded that the learning process using *manik-manik* media can improve students' numeracy literacy skills on integer operation material for grade VI students of one of the elementary private school in TTU district. In line with the discussion above, learning using *manik-manik* media is considered successful due to increased student grades, active students during learning, and responsibility for individual tasks in the learning process, both in group learning and as a whole. Next, in concluding Activities, researchers give tasks to students, and researchers deliver lesson plans at the next meeting and then end with prayer.

Observation Phase

After the learning activities in the classroom to determine the success of the actions taken, the researcher first looks at the observation data of student and teacher activities; second, the test result data given to students at the end of Cycle II learning.

In this meeting, students discussed the addition and subtraction of positive integers with positive and vice versa; the researcher gave a perception related to the last material, namely the addition and subtraction of integers, and then the researcher informed today's subject matter about the concept of operations to calculate the addition and subtraction of positive integers with positive or negative numbers with negative. The results of the research carried out in cycle 2 is 4.6 in interval category good.

Based on the result observation, the teacher activity increased secondly with an interval of 4.6 with the excellent category. The results of observations of teacher activities in learning mathematics integer operation material using *manik-manik* media in grade VI students of one of the private elementary schools in *Kefamenanu* showed that in the second cycle, this is still the same as the previous cycle, namely, in the second cycle, researchers are also still observed by homeroom

teachers VI during learning activities where researchers reflect and correct some mistakes made in the previous process so that In this second cycle, researchers felt even better. However, the percentage gain achieved by researchers was only slightly different from the first cycle, which was an interval of 4.6. At the same time, It is clear that the observations result from student activity, there was an increase in student activity intervals with intervals of 5 and excellent categories. The results of observing student activities in learning mathematics integer operation material using *manik-manik* media in one of the private elementary schools in *Kefamenanu* showed that in this second cycle, researchers also did the same thing to students as in the previous process, namely explaining and providing direction related to the material and the use of *manik-manik* media. Still, in this cycle, students were more enthusiastic about receiving the material, More attention when the teacher explained, more active in asking questions when the teacher provided opportunities, students are also more active in answering questions, students better understood the material and use of media, and students are more skilled and interactive in conducting group discussions. This cycle occurs very well because researchers reflect on the previous process. In this cycle, researchers guide and direct students to stay focused and attentive to the material and the use of the media taught. So the percentage of student activity in cycle two has increased very well, namely 5 in the excellent category.

Reflection Stage

Based on test results and observations obtained in cycle II, class completeness of 88% has reached success indicators, and observation results in cycle II are in a suitable category. So, it can be concluded that using *manik-manik* media can improve students' numeracy literacy skills on integer operation material. The results of this study are in line with the opinion conveyed by (Alfin & Listiadi, 2021) that learning media has an essential function in facilitating the learning process in the classroom, and students are more motivated so they can achieve learning goals better and more perfectly (Zulhasni et al., 2019). Learning using media can help students create a learning atmosphere that is more lively, not monotonous, and not boring (Falahudin, 2014). This aligns with research conducted by (Salam Ahmad Pathus, n.d.) Proving that using *manik-manik* media can improve students' abilities in mathematics subjects with integer material.

Based on research that researchers have conducted, using pre-test questions at the beginning of each cycle (I & II) can help researchers know the abilities possessed by each child to expedite the course of research; after that, researchers also provide post-test questions at the end of each cycle (I & II) to measure the extent of student's ability to the material given during the study. It turns out that there is a difference between before being given *manik-manik* media and after being given these teaching aids. Students become more determined to follow the learning process, more quickly understand the material provided, and increase the abilities students have in literacy and numeracy.

CONCLUSION

Based on the research on integer operation material, it was concluded that learning by using *manik-manik* media can improve students' numeracy skills. This is evidenced by the post-test value (final test of each cycle) carried out in processes I and II, which showed a significant increase, seen from the percentage in cycle one of 36 and an increase in cycle II of 88. In cycle one, only nine students completed it, and in cycle two, as many as 22 students. This shows that using media can help students easily understand each learning material.

REFERENCES

- Abdurahman, M., & Nufus, H. (2014). Penggunaan Media Manik-Manik untuk Meningkatkan Kemampuan Belajar Siswa Anak Tunagrahita Ringan dalam Pembelajaran Matematika.
- Alfin, L. F., & Listiadi, A. (2021). Pengembangan Multimedia Interaktif Berbasis Ispring Suite 8 sebagai Media Pembelajaran Pada Mata Pelajaran Praktikum Akuntansi Lembaga. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 9(1), 58. <https://doi.org/10.24269/dpp.v9i1.2780>
- Arnidha, Y. (2015). Analisis Kesalahan Siswa Dalam Menyelesaikan. *Pendidikan Matematika*, 1(1),

52–63.

- Ayunungtyas, N., & Sukriyah, D. (2020). 1, 2 1,2. *Jurnal Matematika Dan Pendidikan Matematika*, 9(2), 237–247.
- Badhi, M. K., Sa'o., S & Naja. Y. F. (2020). *JUPIKA : Jurnal Pendidikan Matematika Universitas Flores. Pendidikan Matematika*, 3(September), 111–120.
- Ekowati, D. W., Astuti, Y. P., Utami, I. W. P., Mukhlisina, I., & Suwandayani, B. I. (2019). Literasi Numerasi di SD Muhammadiyah. *ELSE (Elementary School Education Journal) : Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar*, 3(1), 93. <https://doi.org/10.30651/else.v3i1.2541>
- Falahudin, I. (2014). Pemanfaatan Media dalam Pembelajaran. *Lingkar Widyaiswara*, 4, 104–117.
- Hazmi. (2019). Meningkatkan Hasil Belajar Pada Operasi Hitung Penjumlahan dan Pengurangan Bilangan Bulat Menggunakan Media Manik-Manik pada Siswa Kelas IV SD Negeri 3 Sekotong Tengah Jl.Raya Sekotong Tengah-Pelangan Kecamatan Sekotong Kabupaten Lombok Barat Kode Post 871830. *Pendidikan Matematika*, 58–72.
- Istiqomah. (2017). Implementasi Penggunaan Media Manik-Manik Warna dalam Pembelajaran Matematika pada Materi Operasi Penjumlahan Bilangan Bulat Kelas IV MIS Bumirejo Kota Pekalongan [IAIN Pekalongan]. <http://perpus.takaan.iainpekalogan.ac.id/>
- Kusmanto, H., & Marliyana, I. (2014). Pengaruh Pemahaman Matematika Terhadap Kemampuan Koneksi Matematika Siswa Kelas VII Semester Genap SMP Negeri 2 Kasokandel Kabupaten Majalengka. *Pendidikan Matematika*, 3(2).
- Leonard, & Amanah, N. (2014). Pengaruh Adversity Quotient (AQ) dan Kemampuan Berpikir Kritis Terhadap Prestasi Belajar Matematika.. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 28(1).
- Mahmud, R. M., & Pratiwi, M. I. (2019). Tidak Terstruktur. *Kalamatika Jurnal Pendidikan Matematika*, 4(1), 69–88.
- Mamoh, O. (2017). Meningkatkan Prestasi Belajar Matematika Melalui Pembinaan Berpikir Logis Dalam Pembelajaran Pada Siswa SMP.
- Masitoh, I., & Prabawanto, S. (2015). Peningkatan Pemahaman Konsep Matematika Dan Kemampuan Berpikir Kritis Matematis Siswa Kelas V Sekolah Dasar Melalui Pembelajaran Eksploratif. *Pendidikan Matematika*, 4, 1–11.
- Perdana, Ryzal, & Suswandari, M. (2021). "Literasi Numerasi Dalam Pembelajaran Tematik Siswa Kelas Atas Sekolah Dasar." *Absis: Mathematics Education Journal* 3(1):9. doi: 10.32585/absis.v3i1.1385.
- Rachmantika, A. R., & Wardono. (2019). Peran Kemampuan Berpikir Kritis Siswa pada Pembelajaran Matematika dengan Pemecahan Masalah. *Pendidikan Matematika*, 2, 439–443.
- Salam, A. P., Mansur(2015). n.d.. "Penerapan Media Manik-Manik untuk Meningkatkan Hasil Belajar Siswa pada Mata Pelajaran Matematika dalam Materi Bilangan Bulat Pendahuluan".
- Siagian, M. D. (2016). Kemampuan Koneksi Matematik Dalam Pembelajaran Matematika. *Pendidikan Matematika*, 2, 58–67.
- Siregar, N. R. (2017). Persepsi Siswa Pada Pelajaran Matematika : Studi Pendahuluan Pada Siswa Yang Menyenangi Game. *Pendidikan Matematika*, 224–232.
- Siska, S., Safei, S., & Sulasteri, S. (2021). Kemampuan Operasi Hitung Bilangan Bulat Menggunakan Media Pembelajaran Manik-Manik Warna. *AULADUNA: Jurnal Pendidikan Dasar Islam*, 8(2), 242. <https://doi.org/10.24252/auladuna.v8i2a10.2021>
- Suryati. (2015). PENGGUNAAN MEDIA MANIK-MANIK UNTUK MENINGKATKAN HASIL BELAJAR PENJUMLAHAN BILANGAN BULAT BAGI SISWA KELAS IV SEKOLAH DASAR. 1–6.
- Suswandari, M. (2018). Membangun budaya literasi bagi suplemen pendidikan di indonesia. *DIKDAS BANTARA*, 1, 20–32.
- Zulhasni, Nuriyah, L., Fitri, A., & Yulis, A. (2019). Al-Mafahim : Jurnal Pendidikan Guru Madrasah Ibtidaiyah Peningkatan Hasil Belajar Siswa Sekolah Dasar Pada Pelajaran Matematika Melalui Media Papan Berpaku . *Al-Mafahim: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 2(1), 1–8.