

UTILISATION OF CUISENAIRE RODS IN ENHANCING MATHEMATICAL ACHIEVEMENT IN FRACTIONS AT THE ELEMENTARY SCHOOL

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Abstract: This research aims to enhance the mathematics learning outcomes of fourth-grade students at SD Negeri 042 Kualu Tambang in the Academic Year 2023-2024 by implementing the Cuisenaire rod media. The research was conducted through an action research approach with two cycles involving pre-research activities, observations, and learning outcome tests. The results show that applying Cuisenaire rod media significantly improves student learning outcomes from 75% in Cycle I to 94% in Cycle II. Despite some notes regarding student inactivity, interview results indicate that students feel interested and joyful during learning with this media. Suggestions include enhancing interactive strategies, varying learning activities, and providing specific training for teachers to optimize the use of Cuisenaire rod media.

Keywords: Mathematics Learning Outcomes, Cuisenaire Rod Media, Fractions

INTRODUCTION

Education has a crucial role in life, enabling growth and achieving a higher standard of living. Kurniawan (2015) explains that education involves a variety of learning experiences at school and in society with specific goals. The main target of national education, according to Purba (2023), is to maximize students' talents so that they become individuals who have faith, and morals, are healthy, knowledgeable, creative, independent, and a democratic and responsible society.

Mathematics is a central subject that is always taught to students starting from elementary school. Mathematics plays an important role in training thinking, reasoning, directed and structured abilities. It can be seen that every part of human life contains mathematics, including counting and measuring. Furthermore, according to Kusumawardani's (2018) explanation, mathematics also plays a role as a tool for solving problems in the development of science and technology. Because all life problems that require careful and thorough solutions are always related to MTK.

Mathematics, as a central subject in Elementary School, plays an important role in training thinking, reasoning, and systematic skills. However, observations at SD Negeri 042 Kualu Tambang show that mathematics is often considered difficult and less exciting, especially regarding fractions. The results of the basic competency test show that around 56.25% of students have not achieved a score above the KKM.

The main problem lies in the lack of student enthusiasm for learning mathematics. Students are passive, perhaps because they have not been given adequate opportunities to contribute or perhaps because their understanding of the material is not yet optimal. The effectiveness of learning, according to Ningsih (2015), can be increased by ensuring that learning takes place optimally according to students' needs. By increasing student enthusiasm, it is hoped that they can improve their initially low grades to become better because of their desire or motivation to learn.

Mathematics as an abstract subject requires teachers to choose strategies that suit students' abilities (Rahayu et al., 2016). Mathematics is also a lesson that requires high concentration and understanding to understand, which makes many students feel that this lesson is very annoying. Teachers play a key role in achieving learning goals in the classroom. They are professionals who are responsible for planning, implementing, evaluating learning outcomes, providing guidance, and even conducting research and contributing to the environment. Good and understanding educators must continue to strive to organize their classes well so that learning takes place effectively and learning targets are met satisfactorily.

For students to grow and develop appropriately, teachers must consider students' characteristics, such as their interests, abilities, and background. Every student is different in this regard. Instead, teachers need to design learning activities and materials that suit these characteristics. It is important to ensure that learning activities and materials do not intimidate students or hinder their interests. This ability is very important to achieve learning goals optimally (Taufik, 2019).

At the elementary school level, Biyanto (2021) said, children are in the phase of learning while playing, with an understanding of knowledge that starts from real concepts to abstract ones. Hyang means that the learning process is carried out while playing to achieve the desired understanding. Each student has talents and intelligence that are different from each other. Some students may be proficient in counting but have difficulty memorizing. Some may be poor in arithmetic but smart in writing. This tendency also applies to the way they understand information, some students understand by hearing, while others understand better through visuals or direct action. The use of learning media can provide sensory stimulation, which allows learning interactions to be clearer, easier to understand, concrete, and easier for students to remember. This is supported by research by Sari et al. (2022) which shows that learning media in elementary school mathematics can take the form of concrete objects that can be observed, touched, and manipulated to teach mathematical concepts and skills effectively. Mathematics can also be an understanding in life that allows students to be able to use it in everyday life

The learning process provided by educators today is still always monotonous, especially in explaining how to add fractions. Therefore, the author

wants to present innovation in learning by using Cuisenaire stick-shaped learning media (Rahayu et al., 2016). It is hoped that the Cuisenaire Rod can increase students' understanding of how to add fractions.

Cuisenaire rods are block-shaped displays with 10 different sizes and colors. This approach follows research by Sekarani (2010) which shows that the Rod Cuisenaire display can be used to teach how to sort, compare, add, subtract, multiply, and divide fractions.

As stated by Izmi (2017), the use of Batang Cuisenaire in the teaching and learning process has benefits in motivating students and fostering their interest in learning. The method taught is the same as the mental growth stage of students who still enjoy playing and thinking concretely. Using the Cuisenaire Rod makes it easier to learn lessons and encourages them to be more enthusiastic in learning and understanding the concepts being taught because they are directly involved in activities involving the display and carrying out calculation operations as per the material provided.

METHODE

The method used in the research is classroom action research (PTK). The research subjects consisted of 16 fourth-grade students at SD Negeri 042 Kualu, Tambang, with details of 5 girls and 11 boys. The classroom action research model adopted in this research refers to the model proposed by Arikunto (2008). In this action research, two cycles were used, each cycle consisting of four activities, namely planning, action, observation, and reflection. The decision to continue to the next cycle depends on achieving the predetermined success indicators. The cycle is considered complete if the success indicators have been achieved. The number of cycles carried out will be determined based on the achievement of previously determined success indicators. The data collected in this research involves observations of teacher or researcher activities and student learning outcomes. The focus of this research is to analyze the application of Cuisenaire stem media to improve mathematics learning outcomes in fraction material in Class IV of SD Negeri 042 Kualu, Tambang.

RESULTS AND DISCUSSION

After going through several stages, starting from pre-research to providing action in cycle I and cycle II, the results of observations and results of learning mathematics regarding fractions using Cuisinart rods were obtained. Research conducted in class IV of SDN 042 Kualu Tambang FY 2023-2024. The following are the results of the actions in cycle I:

Table 1. Cycle I Mathematics Learning Results

Interval	Cycle I		
	Frequent	Category	Percentage
80-100	3	Complete	75%
70-79	9	Complete	
60-69	1	Incomplete	
50-59	3	Incomplete	25%
< 49	-	Incomplete	
Amount	16		100%

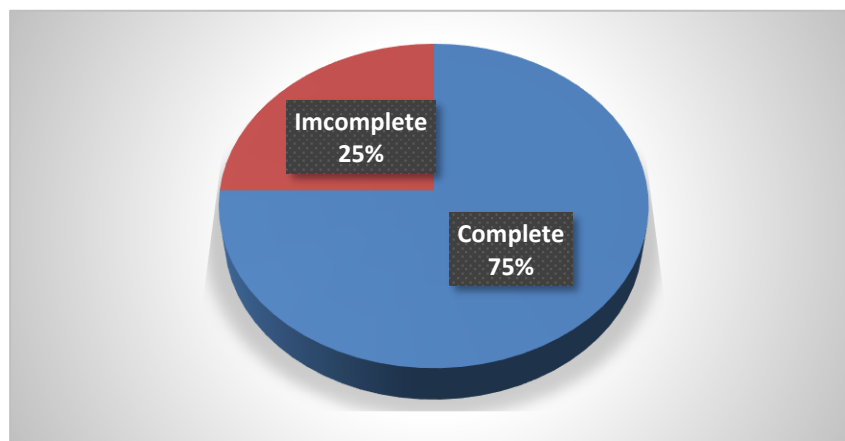


Figure 1. Percentage of Student Completion in Cycle I

Cycle I research data shows that applying Cuisinart rods can make mathematics learning outcomes in fractions higher. There was an increase from cycle 1, as much as 75%, which had reached the Minimum Completeness Criteria (KKM) of 70. The details were that 3 students got a score of 80-100, 9 students got a score of 70-79, and 1 student got a score of 60-69. 3 students got a score of 50-59 and no students got a score below 40. This is proven by the results of observations of student learning progress in fraction material. Students showed approval for the use of cuisenary stem media, admitting that it increased their motivation, self-confidence, active participation, and ability to ask questions, express opinions, and express ideas. Some notes taken by researchers include: a) Some students are still passive and less active in the lesson, b) two students are interested in drawing during the lesson, c) Some students are involved in their activities in class, some are even joking with their classmates, d) Some students are not yet accustomed to using culinary stem media, and e) When answering post-test questions, there are still those who try to cheat or open the book, showing a lack of confidence in mastering the material and responding to the researcher's questions. Therefore, it is necessary to continue in cycle II to improve students' mathematics learning achievement according to the objectives of this research.

The results of observations of student results in cycle II can be seen in the following table:

Table 2. Cycle II Mathematics Learning Results

Interval	Cycle I		
	Frequent	category	Frequent
80-100	13	Complete	94%
70-79	2	Complete	
60-69	1	Incomplete	
50-59	-	Incomplete	6%
< 49	-	Incomplete	
Total Amount	16		100%

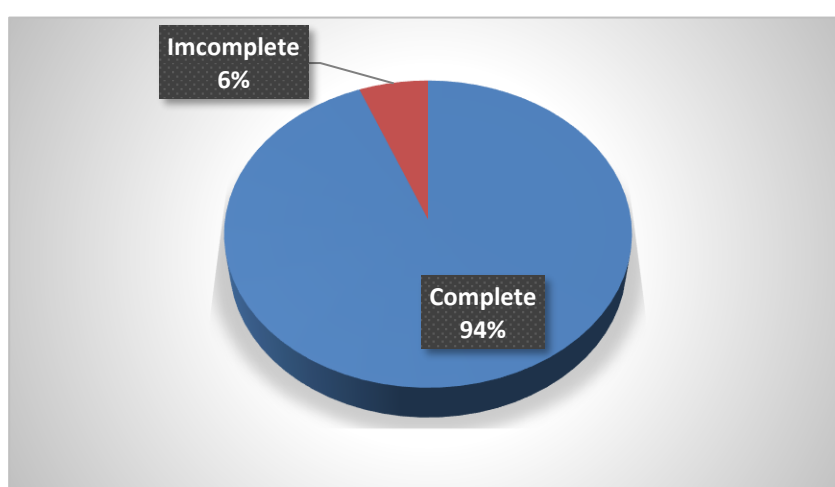


Figure 2. Percentage of Completion in Cycle II

It can be seen that the learning activities of class IV students are in line with expectations in cycle II. The results of the second simulation show that there are 15 students (94%) who have achieved learning completeness, while one student (6%) has not yet achieved complete learning. The details are that 13 students scored 80-100, 2 students scored 70-79, and 1 student scored 60-69. There are no students whose scores are 50-59 and below 40. This can happen because by implementing learning with Cuisenary stems, where students focus more on learning activities, idea production, cooperative learning skills, and actively interacting with fellow students, which influence each other. and create a better learning experience. The results of interviews with students also show their interest and enjoyment during learning using Batang Cuisenari Media, because they can understand lessons more easily and overcome boredom with fun learning. Students are also more courageous to participate and ask questions when facing problems.

The success of the research carried out was due to the participation of students, teachers, observers, and other parties who supported the researchers during the learning process. From the test results, it can be seen that the application of mathematics learning about fractions through Cuisenari stem media makes student learning outcomes high, from 75% in cycle I to 94% in

cycle II. Through this research, the aim of improving student learning outcomes was achieved, because learning in cycle two reached the expected maximum level of completeness. Thus, the use of Cuisinart stems media can make mathematics learning outcomes in fractions material for class IV students at SD Negeri 042 Kualu Tambang for the 2023-2024 academic year improve rapidly..

The results of this research are per the opinion of Ilham & Tiodora (2023), the research results in the form of empirical support for several learning theories that have been recognized in the context of mathematics education. Constructivism theory, which emphasizes the active role of students in building knowledge, is reflected in the increase in student learning outcomes in fraction material through the application of Cuisenary stem media. Pranyata (2023) also states that students not only receive information but are also actively involved in constructing their understanding of mathematical concepts through interaction with teaching aids.

In addition, cooperative learning theory finds validity in this mathematics learning context. Suprpti uses cuisenary stem media to encourage students to work together, discuss, and help each other in solving mathematical problems. Collaboration between students not only increases their understanding but also creates a positive and inclusive learning environment (Wantika, 2017).

The theory of learning motivation becomes relevant in analyzing the effect of applying cuisenari stem media on student learning outcomes. Observation results showed that students felt an increase in their intrinsic motivation, which may be caused by the sense of satisfaction and success obtained through interesting and enjoyable activities using these teaching aids. This increase in motivation can contribute to increasing students' active participation in mathematics learning (Tanjung, 2022).

The application of active learning theory can be identified in the context of using cuisenary stem media. Students not only receive knowledge passively but are directly involved in the manipulation of cuisenary stems to understand mathematical concepts. This process creates a more interactive and immersive learning experience, allowing students to actively engage in the process of constructing their knowledge.

Finally, Vygotsky's theory of the proximal zone of learning (ZPD) can be applied in the context of this research. The use of cuisenari stem media can be considered as an aid or tool that supports students in achieving their maximum learning potential. Through learning activities with this media, students can expand the limits of their abilities and obtain high results, according to their ZPD (Agustyaningrum, 2022).

CONCLUSION

From research conducted on fourth-grade students at SDN 042 Kualu Tambang in the 2023-2024 academic year, it can be concluded that the application of the mathematics learning method of fractions using cuisenari sticks significantly improves student learning outcomes. In cycle I, it increased from 75% in the 80-100 value range, reaching a KKM of 70%, to 94% in cycle II. This shows that students are more involved, challenged, and confident in learning, which is

reflected in the results of observations and tests. Although there are several notes regarding students who are still passive, less active, or not yet accustomed to cuisenary stem media, this can be overcome through improvements in subsequent cycles. From research conducted on fourth-grade students at SDN 042 Kualu Tambang in the 2023-2024 academic year, it can be concluded that the application of the mathematics learning method of fractions using cuisenari sticks significantly improves student learning outcomes. In cycle I, it increased from 75% in the 80-100 value range, reaching a KKM of 70%, to 94% in cycle II. This shows that students are more involved, challenged, and confident in learning, which is reflected in the results of observations and tests. Although there are several notes regarding students who are still passive, less active, or not yet accustomed to culinary stem media, this can be overcome through improvements in subsequent cycles..

REFERENCES

- Agustyaningrum, N., & Pradanti, P. (2022). Teori Perkembangan Piaget dan Vygotsky: Bagaimana Implikasinya dalam Pembelajaran Matematika Sekolah Dasar?. *Jurnal Absis: Jurnal Pendidikan Matematika Dan Matematika*, 5(1), 568-582.
- Arikunto, S. (2008). *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: Rineka Karya
- Biyatno, O. (2021). Metode mengajar penjas dengan memahami karakteristik anak SD. *Jurnal Edukasimu*, 1(2).
- Ilham, M. F., & Tiodora, L. (2023). IMPLEMENTASI TEORI BELAJAR PERSPEKTIF PSIKOLOGI KONSTRUKTIVISME DALAM PENDIDIKAN ANAK SEKOLAH DASAR. *Multilingual: Journal of Universal Studies*, 3(3), 380-391.
- Izmi, M. (2017). Penerapan batang cuisenaire untuk meningkatkan pemahaman konsep penjumlahan pecahan pada siswa kelas IV SD. *Jurnal Pendidikan Sekolah Dasar*, 3(3), 1-9.
- Kurniawan, M. I. (2015). Tri Pusat Pendidikan Sebagai Sarana Pendidikan Karakter Anak Sekolah Dasar. *Jurnal Pendidikan*, 4(1), 41-49.
<https://doi.org/10.21070/pedagogia.v4i1.71>
- Kusumawardani, D. R., Wardono, & Kartono. (2018). Pentingnya Penalaran Matematika dalam Meningkatkan Kemampuan Literasi Matematika. *PRISMA, Prosiding Seminar Nasional Matematika*, 1(1), 588-595.
- Ningsih, A. (2015). Pengaruh penggunaan media Batang Cuisenaire terhadap hasil belajar siswa pada materi penjumlahan dan pengurangan bilangan di sekolah dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 3(02), 1912-1921.
- Purba, R., Hulu, A., Herawati, J., Sitorus, H., & Herlina, E. S. (2023). Pengaruh Permainan Balok Angka Terhadap Kemampuan Mengenal Lambang Bilangan Kelompok A TK Pembina HKBP Tarutung. *Jurnal Arjuna: Publikasi Ilmu Pendidikan, Bahasa dan Matematika*, 1(5), 171-187.
- Pranyata, Y. I. P. (2023). KAJIAN TEORI KONSTRUKTIVIS SOSIAL DAN SCAFFOLDING DALAM PEMBELAJARAN MATEMATIKA. *JIP: Jurnal Ilmu Pendidikan*, 1(2), 280-292.

- Rahayu, I., Margiati, K. ., & Asran, M. (2016). Pengaruh Penggunaan Media Batang Cuisenaire Terhadap Hasil Belajar Matematika Di Sekolah Dasar. *Jurnal Pendidikan Dasar*, 03(02), 1–9.
- Sari, A. N., Mardeli, M., & Oktamarina, L. (2022). Pengaruh media balok cuisenaire terhadap kemampuan matematika permulaan pada anak kelompok B. *Jurnal Edukasi Matematika Dan Sains*, 10(2), 334–343. <https://doi.org/10.25273/jems.v10i2.13251>
- Sekarani, R. & W. D. A. (2010). Pengaruh Media Batang Cuisenaire Untuk Meningkatkan Kemampuan Operasi Hitung Penjumlahan Siswa Tunagrahita Kelas IV SDLB. Jurusan Pendidikan Luar Biasa. *Jurusan Pendidikan Luar Biasa, Fakultas Ilmu Pendidikan*, 2(3), 24–35.
- Tanjung, Y. P. (2022). Hubungan Minat Belajar Dan Motivasi Belajar Dengan Hasil Belajar Matematika Pada Siswa Kelas V Di Mis Nurul Hikmah Ujung Padang. *Pionir: Jurnal Pendidikan*, 11(1).
- Taufik, A. (2019). Analisis karakteristik peserta didik. *El-Ghiroh: Jurnal Studi Keislaman*, 16(01), 1-13.
- Wantika, R. R. (2017). Pembelajaran kooperatif tipe tai berdasarkan teori beban kognitif. *Buana Pendidikan: Jurnal Fakultas Keguruan dan Ilmu Pendidikan Unipa Surabaya*, 13(23), 41-46.