ISSN xxxx-xxxx (print) | xxxx-xxxx (online)

Journal of Innovation, Character and Excellent Elementary Education (JICE3)
Volume 01 No 01 Halaman 32-38

IMPROVING STUDENT LEARNING OUTCOMES IN TWO-DIGIT SUBTRACTION THROUGH BORROWING TECHNIQUES WITH NUMBER BAG MEDIA

Mubarak
[1] Lambung Mangkurat University, Banjarmasin, Indonesia
Email: mubarok@ulm.ac.id

Submitted
June-05-2025

Revised
June-06-2025

Accepted
June-06-2025

Published
June-10-2025

Kata Kunci:
Capaian Pembelajaran; Pengurangan Dua Digit; Media Tas Angka.

Keyword:
Learning Outcomes; Two-Digit Subtraction; Number Bag Media

Abstrak

Penelitian ini bertujuan untuk meningkatkan hasil belajar dan aktivitas peserta didik, yang menunjukkan nilai di bawah KKM dan menganggap pelajaran matematika sebagai hal yang menakutkan. Peserta didik kurang termotivasi dalam pembelajaran matematika. Untuk mengatasi masalah ini, peneliti menggunakan media kantong bilangan pada materi pengurangan dua angka. Jenis penelitian ini adalah Penelitian Tindakan Kelas (PTK) dengan analisis data kuantitatif. Instrumen yang digunakan meliputi RPP, media ajar, dan lembar observasi. Hasil penelitian menunjukkan peningkatan signifikan dalam hasil belajar peserta didik, dengan nilai pra observasi sebesar 13,33%, meningkat menjadi 53,33% pada siklus I, dan 86,23% pada siklus II. Aktivitas peserta didik juga meningkat, dari 65,23% pada pra observasi, menjadi 75,25% pada siklus I, dan 80% pada siklus II. Berdasarkan hasil ini, dapat disimpulkan bahwa penggunaan media kantong bilangan efektif dalam meningkatkan kemampuan pengurangan dua angka peserta didik secara optimal

Abstract

This study aims to improve the learning outcomes and activities of students, who show values below the KKM and consider mathematics lessons as something scary. Students are less motivated in learning mathematics. To overcome this problem, the researcher used number bag media on the material of subtracting two digits. This type of research is Classroom Action Research (CAR) with quantitative data analysis. The instruments used include RPP, teaching media, and observation sheets. The results of the study showed a significant increase in student learning outcomes, with a pre-observation value of 13.33%, increasing to 53.33% in cycle I, and 86.23% in cycle II. Student activity also increased, from 65.23% in pre-observation, to 75.25% in cycle I, and 80% in cycle II. Based on these results, it can be concluded that the use of number bag media is effective in improving students' two-digit subtraction abilities optimally.

Citation:
Mubarok. (2025). Improving student learning outcomes in two-digit subtraction through borrowing techniques with number bag media. *Journal of Innovation, Character and Excellent Elementary Education, 01* (01), 31-37.

INTRODUCTION

Education is part of an effort to develop human potential, as an initiative in providing empirical knowledge that is learned in a structured manner, both in formal and non-formal forms, in

ISSN xxx-xxx (print) | xxxx-xxxx (online)
Journal of Innovation, Character and Excellent Elementary Education (JICE3)
Vol. 01 No. 01 pp. 31-37

school and outside of school, which lasts throughout human life. The main goal is to optimize knowledge (Teguh Triwiyanto, 2014). According to Elfachmi (2016: 16), the benefits of education include: a) obtaining the knowledge needed for the future, b) learning outside of school can broaden the horizons of knowledge, c) by broadening knowledge, we can achieve the desired ideals, d) education shapes humans to have noble behavior. Overall, education is very beneficial for life, helping individuals become true individuals, because basically, education is a tool to strengthen the life of the nation and state.

Education covers various levels, with the first and most basic level being education at the elementary school (SD) level. Elementary schools generally focus on developing students' potential in three main aspects: cognitive (knowledge), affective (emotional), and psychomotor (physical activity). The development of the knowledge aspect in early childhood is also regulated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 146 of 2014 concerning National Standards for Early Childhood Education, which states that children aged 4-5 years should be able to achieve abilities such as counting objects from one to ten, recognizing numbers, describing number symbols, and understanding letters. At the elementary school level, there are three main skills that need to be developed, namely reading, writing, and arithmetic. These abilities are reflected in language skills which include reading, writing, and speaking, as well as arithmetic skills which include addition, subtraction, multiplication, division, simple measurement, and understanding geometric shapes. All of these skills are very important and can be applied in students' daily lives.

Mathematics is one of the subjects taught in elementary schools and can develop critical, numerical, and logical thinking skills. According to Liberna (2018: 99), mathematics is a compulsory subject at every level of elementary education. In order for mathematics learning to achieve results in accordance with the established indicators, teachers need to apply various strategies to encourage cooperation and active participation of students in the learning process. As explained by Asri (2015: 70), one way to make it easier for students to understand mathematical concepts is to use the right media or learning methods. The use of learning media aims to make it easier for students to understand number operations, such as addition and subtraction. Learning media effectively helps teachers in carrying out learning activities in accordance with the expected learning indicators (Ermiana, Ida, et al., 2020).

The word "media" comes from the word "medius," which means middle, intermediary, or messenger. Thus, media functions as a means to convey information to other people or individuals. The media used in education is a tool or intermediary that can communicate messages or learning materials from educators to students in the teaching and learning process (Erfan, M, et al., 2020). Basically, learning media makes it easier for teachers to carry out effective learning activities to achieve the desired learning indicators (Ermiana, Ida, et al., 2020).

To help students in calculations, appropriate media are needed, one of which is the number bag media. According to Darmanyanti, in the Big Indonesian Dictionary, "kantung" means pocket, while "bilangan" refers to the number of objects or abstract values that can be added or multiplied. From this understanding, it can be concluded that a number bag is a container that can be used to store units of quantities that represent abstract mathematical values that can be counted, added, or multiplied. Heruman (2007:7) explains that a number bag is a learning aid consisting of several transparent plastic bags in the shape of pockets, which are placed on a cloth or board. These bags are

ISSN xxxx-xxxx (print) | xxxx-xxxx (online)
Journal of Innovation, Character and Excellent Elementary Education (JICE3)
Volume 01 No 01 Halaman 32-38

used to store objects such as straws, marbles, sticks, or other objects as representations of numbers. Heruman (2014:7) adds that the number bag media functions in the formation of basic concepts, interpretation of concepts, and development of skills. To use number pockets in subtraction using the borrowing technique, the steps are: a) Students insert straws according to the tens and units places, b) Students state the number indicated by the number of straws in each pocket, c) Students move as many straws as the subtracted number to the subtracted pocket, d) If the subtracted number is smaller than the subtracted number, borrow one bundle of tens, e) Move the remaining straws to the result pocket, f) Students count the number of straws remaining in the result pocket and record the answer.

The observation results show that learning still tends to be monotonous due to the selection of media that is not varied enough, so that students consider mathematics subjects difficult to understand, boring, and have a negative impact on their grades and activeness in learning. Seeing this situation, researchers are interested in implementing number pocket media as an effort to improve understanding of the concept of subtracting two numbers. Through the use of this media, it is expected to support students in understanding the basic concept of subtraction in mathematics and improve their learning grades. In addition, number pocket media can also stimulate students' creativity and independence, because it provides opportunities for each student to be active independently.

According to Martianty Nalole, the use of number pocket media in learning arithmetic operations, especially in addition and subtraction materials, has several advantages. Some of these benefits include: 1) Increasing students' interest in ongoing learning, 2) Helping students understand the material being taught because they are directly involved in the addition and subtraction process, 3) Providing opportunities for students to be more active in observing and developing their skills creatively and independently. Meanwhile, according to Adharu Rizky (2017), there are several disadvantages in the use of number pocket media, such as: boredom that arises when waiting for their turn in a large class, relatively long production time, and the need for teacher supervision to avoid mistakes. In addition, number pocket media is not suitable for learning arithmetic operations involving negative numbers or decimals, because this media is not equipped with negative or decimal symbols.

METHOD

This study uses a classroom action research (CAR) approach. The selection of this type of research is based on the problems that arise from the class conditions themselves, namely to increase the percentage and activeness of students. According to Pahleviannur & et al. (2022), classroom action research is an effort to analyze learning activities that are given interventions, which are deliberately carried out in a class with the aim of understanding existing problems and improving the quality and learning process in the class.

This research was conducted in two cycles using the Kurt Lewin model. According to Kurt Lewin, there are four components applied in the classroom action research process, namely planning, action, observing, and reflecting (Payadna, I Putu. A.A, 2022). This research will be considered complete if all the established completion criteria are met.

The explanation of the stages in this research is as follows: 1)**Planning stage**is a preparatory stage that includes preparatory steps for the actions to be given. At this stage, the researcher holds

ISSN xxx-xxx (print) | xxxx-xxxx (online)
Journal of Innovation, Character and Excellent Elementary Education (JICE3)
Vol. 01 No. 01 pp. 31-37

discussions with teachers regarding the problems that are the focus of the research, prepares lesson plans and observation sheets, prepares number bag aids, and prepares learning outcome evaluation instruments. 2)**Level of action implementation**is the stage where researchers take action to improve teaching and learning activities. In this study, the action is in the form of introducing and using number bag aids and providing material on the concept of addition with borrowing techniques. 3)**Observation stage**conducted systematically by researchers to observe the results or impacts of actions on the learning process and outcomes, and to identify obstacles that occur during implementation. At this stage, researchers observe student participation in the learning process using the number bag tool. 4)**Level of reflection**is an evaluation activity of the process and impact of the corrective actions that have been taken. This reflection includes factors that support success or obstacles in the addition learning process. Based on the results of observations, researchers conducted reflections on the application of number bag aids to improve students' counting skills.

This study was conducted in class 2 with 15 students, consisting of 8 males and 7 females. The data collection technique used in this study was observation of student activity using observation tests and evaluation of success results. For data analysis, quantitative data analysis was used with data processing techniques using simple statistics, such as calculating the average, mode, standard deviation, and percentage (Saputra et al., 2021).

RESULTS AND DISCUSSION

The first step in this study was to prepare teaching materials such as lesson plans for 2-digit subtraction material, teaching materials to be used, student activity observation sheets, and initial and final test questions using number bags as the media. In the initial stage, the researcher conducted an initial test to identify the problem of low learning outcomes in 2-digit subtraction material and to assess student activity using observation sheets.

The results of the initial test showed an average score of 15 students of 60.96, with the lowest score of 60 and the highest score of 70. Of the 15 students who took the initial test, 13 students got low scores, while 2 students achieved scores that met the KKM standard. The completion standard set for the 2-digit subtraction material is 70, so 86.67% of students got scores below the KKM and only 13.33% met the standard. These results indicate low student outcomes and activeness which only reached 65.23%, so the teacher continued to cycle 1.

Figure 1. Results and Activities of Pre-Observation Students

In cycle I, learning uses number bag media for 2-digit subtraction material, which shows an increase in the results of the value and observation of student activity. The percentage of increase in the results obtained by students reached 53.33%, with 8 students successfully achieving completeness, while 7 students who have not reached the KKM experienced a percentage decrease of 46.67%. The results of the observation of activity showed a level of achievement of 75.25%. Based on these results, researchers and teachers decided to continue further action, because there are still many students who have not achieved the KKM and the average class value has not reached 80%, while the classical completeness target is 80%.

Figure 2. Cycle 1 Learning Outcomes and Learning Activities

ISSN xxxx-xxxx (print) | xxxx-xxxx (online)
Journal of Innovation, Character and Excellent Elementary Education (JICE3)
Volume 01 No 01 Halaman 32-38

After seeing the results of cycle I, the action taken was to continue to cycle II. In cycle II, the results showed that 15 students succeeded in achieving the predetermined percentage, which was 80% in classical completeness. Of the 15 students, the number who had not met the criteria decreased to 3 people (20%), while those who completed increased to 13 students (80%). In addition, student activity also increased to 86.23%. This result is very satisfying and has met the completeness indicators, so this study is considered sufficient and does not need to be continued further. The percentage of student success and observation of activity can be explained through the following diagram:

Figure 3. Learning Outcomes Obtained and Student Activities

Comparison of the results obtained between cycle I and cycle II, based on percentage, shows that in cycle I the completion rate was 53.33%, which then increased to 80% in cycle II. As for the percentage of student activity completion, in cycle I it was recorded at 75.25% and increased to 86.23% in cycle II.

Figure 4. Comparison of Student Results, Cycles I and II

Figure 5. Student Observation, Pre-Observation, Cycle I and II

Based on the explanation above, the use of number pocket media can improve students' grades. This can be seen from the significant increase in the results of pre-observation, cycle I, and cycle II. At the pre-observation stage, students' grades were still below the KKM, which was caused by the lack of implementation of learning media that were in accordance with the material, many students still had difficulty understanding the material, lack of motivation from teachers, and boredom of students who often played and chatted with their deskmates. The lack of activities that could make them work and study was also a factor causing low student activity, so the research was continued to cycle I.

Judging from the percentage in cycle I, learning has increased, although it has not reached the desired value. This is because students are still not used to using number pocket media, and researchers have not provided a sufficiently detailed explanation of the steps in using the learning media. Some students still tend to pay attention to the activities of their deskmates when carrying out learning steps. Although student activity has increased, it has not met the established indicators, so the researcher continued the research to cycle II. In cycle II, there was a significant increase, which can be seen from the diagram above, where student scores increased and student activity has met the established indicators, so the research was stopped.

This research was conducted by several researchers, as explained by Aditya Pratama (2019), which describes the application of number pocket media in mathematics learning can improve the learning outcomes of grade I students. In cycle I, there was an increase of 55.56%, and in cycle II it increased to 85.19%. The average value of learning outcomes in cycles I and II also increased, from 62.94 to 82.96. In line with the research of Rahmatun Najilah (2024), the results of the study showed an increase in the percentage of students' initial numeracy skills, which in cycle I reached 58.33% and increased by 33.33% to 91.66% in cycle II. The average value in cycle I was 74.16 increasing

to 80.83 in cycle II. These results indicate that the application of number pocket media can improve students' initial numeracy skills and increase teacher and student activities.

Maulia Anisa Sabilla et al (2022) also reported that the research conducted showed the influence of number bag media on mathematics learning outcomes, especially on addition material for grade III students. The results obtained from the experimental class were better than the control class that did not use number bag media. The average score of the results obtained by students in the experimental class after treatment was 82.61, while in the control class it was 70.00. Based on the N-Gain test analysis, the control class obtained a score of 0.3038 which is included in the moderate category, while the experimental class obtained a score of 0.7257 which is included in the high category. Thus, it can be concluded that number bag media has an effect on the success of learning mathematics addition material for students.

CONCLUSION AND RECOMMENDATION

Based on this study, it can be concluded that the results and activities of students increased when using the learning media of learning bags. This can be seen from the percentage of values in the pre-observation, cycle I, and cycle II. Success can be seen from the analysis of research data which shows an increase in cycle I and cycle II respectively. At the pre-observation stage, the results of students have not reached the KKM value with only 13.33%. In cycle I, the results of students increased to 53.33%, and in cycle II increased again to 80%. Meanwhile, observation data on student activity shows that at the pre-action stage, student activity reached 65.23%, in cycle I increased to 75.25%, and in cycle II increased again to 86.23%. This shows that the number bag media can influence learning outcomes and increase student activity.

Based on the results of the research conducted, I suggest that teachers be clearer in explaining the steps of the method to be used, so that learning runs as expected. Teachers also need to find appropriate models for the subject matter being taught. In addition, number bag media can be used as an alternative in mathematics learning in the future.

REFERENCES

Asri, E. Y., & Noer, S. H. (2015). Guided Discovery Learning in Mathematics Learning. In*National Seminar and Mathematics Education UNY*.

Elfachmi, A. K. (2016). *Introduction to Education*. Jakarta: PT.

Erfan, M., Widodo, A., Umar, U., Radiusman, R., & Ratu, T. (2020). Development of an Android-Based Educational Game “Physics Words” for Elementary School Children on the Material of the Concept of Force.*Lectura: Journal of Education*, 11(01), 31-46. https://doi.org/10.31849/lectura.v11i1.3642

Ermiana, I., Oktaviyanty, I., Fauzi, A., Hidayati, V. R., & Setiawan, H. (2020). Workshop on Making Puzzle Media from Used Cardboard Based on Thematics at SD Negeri 1 Tamansari.*Journal of Education and Community Service*, 3(3), 194. https://doi.org/10.29303/jppm.v3i3.2055

Heruman. (2007).*Mathematics Learning Models in Elementary Schools*. Bandung: Offset Works.

Heruman. (2014).*Mathematics Learning Models in Elementary Schools*. Bandung: PT. Rosdakarya Youth.

Johni, D. (2016).*Integrated Learning For Kindergarten*. Free Media Prenada.

Najilah, R., & Suciyati. (2024). The Use of Number Pockets Media to Improve the Beginning Arithmetic Ability of Class II Students of SDN Inpres Dena.*Journal of Education and Social*, 5(1), 1-9. https://doi.org/10.53299/diksi.v5i1.368

Nalole, M. (2011). Improving Students' Skills in Subtracting Whole Numbers with Borrowing Techniques Through Number Bag Media in Class II of SDN Pauwo, Kabila District, Bone Bolango Regency.*Innovation Journal*, 8(01), 113-125.

Pahleviannur, M. R., & et al. (2022). Classroom Action Research.*Indonesian Journal of Accounting Education*, 5(1), 87-93.

Payadna, I. P. A. A. (2022). *Complete Guide to Classroom Action Research (CAR)*. Deepublish.

Pratama, A. (2019). Efforts to Improve Mathematics Learning Outcomes Using Number Bag Media.*Electronic Journal of Elementary School Teacher Education*, 8(22), 183-189.

Rizky, A. (2017). Improving the Ability to Calculate Addition Through Number Bags for Low Vision Students of Class II SLB B Yaketunis Yogyakarta.*Widia Orthodidactic Journal*, 6(6), 629-637.

Sabilla, M. A., Gunayasa, I. B. K., & Tahir, M. (2022). The Effect of Number Bag Media on Mathematics Learning Outcomes in Addition Material for Grade III Students of SDN 1 Cakranegara in the 2022 Academic Year.*Scientific Journal of Elementary Education*, 07(02), 798-806. https://doi.org/10.23969/jp.v7i2.6682

Saputra, N., Zanthy, L. S., Gradini, E., Jahring, R., Rif'an, A., & Arifin, A. (2021). *Classroom Action Research*. Earth of Letters.

Triwiyanto, T. (2014). *Introduction to Education*. Jakarta: PT.