JHSS (Journal of Humanities and Social Studies)
https://journal.unpak.ac.id/index.php/jhss
Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

EFFECTIVENESS OF LEARNING MATH "SPINNING" USING FLASHCARDS AND NUMBER BLOCKS FOR STUDENTS WITH DYSCALCULIA

Mutiara Wahyu Sekar Pambayun[a*)], Minsih [a)]

[a)] *University of Muhammadiyah Surakarta, Surakarta, Indonesia*

[*)]*Corresponding Author: A510210072@student.ums.ac.id*

Article history: *received 21 February 2025; revised 02 March 2025; accepted 04 April 2025* *DOI: https://doi.org/10.33751/jhss.v9i1.11920*

Abstract. The field of science that is considered an important basis for everyone is mathematics, because of its widespread application to various disciplines of knowledge. However, many students experience obstacles in following math lessons. Therefore, this study aims to examine the effectiveness of math learning with the "gasing" method using flashcards and number blocks for students with dyscalculia. This article is written using quantitative methods with a single subject experimental design using data collection techniques through purposive sampling techniques. The data collected are scores in the form of percentages. Data validity was tested using pretest and posttest. Data analysis was conducted using the Wilcoxon Signed-Rank Test. This study involved five students who were not in the same class, but still underwent the same intervention. The results showed that learning "spinning tops" using flashcards and number blocks in Baseline Phase A1 with a standard deviation of 10.95 and a standard error of the mean of 4.90. Then in Phase A2 it was seen to increase with a standard deviation of 8.94 and a standard error mean of 4.00. This is also seen in the bar graph which illustrates the increase in the average score of the A1 baseline phase pre-test and the A2 phase post-test after the experiment. The average pre-test score of 32 indicates the initial condition of students before receiving treatment then the average post-test score increased to 66 after students underwent learning with the "spinning top" method using flashcards and number blocks. Thus learning "gasing" using flashcards and number blocks has a significant effect in improving the math skills of students with dyscalculia.

Keywords: math top learning; flashcards media; number blocks; dyscalculia students; learning application

I. INTRODUCTION

Dyscalculia is one of the major challenges in education, especially in teaching mathematics. Students with this condition often struggle to understand numbers, perform calculations, and recognize basic mathematical patterns, which results in low achievement in these areas. In addition, mathematics is a continuous science, so understanding basic concepts is very important to be able to understand more complicated material. [1] . Mathematics is also considered the main foundation for all fields of science, because its application covers almost all fields of knowledge. The process of learning mathematics at school aims to help students master mathematical concepts, apply logical thinking skills, solve problems, appreciate the role of mathematics in everyday life, and be able to convey ideas through symbols, the willingness to learn, physiological conditions, intelligence levels, psychological aspects, and the learning methods used. According to the opinion of(Patricia & Zamzam, 2019) states that external factors are factors that can affect learning outcomes that come from outside the individual. Factors that include influences from the family environment, school, society, and surrounding factors. Elementary school students who face learning difficulties, especially in mathematics, will be affected by their academic performance. These difficulties are usually related to mathematics, which is a compulsory subject at every level of education, both at primary and secondary levels. Students who have special needs such as dyscalculia have the right also to obtain educational opportunities that are equal to other children in general(Nugroho & Minsih 2021) . Therefore, it is necessary to apply special methods in teaching mathematics, especially at the elementary school level. Based on conditions in the field, there are still many students who have difficulty or even do not understand math concepts.

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

In this situation, it is necessary to apply learning methods that give students the opportunity to actively build understanding based on real experiences. Methods that are fun, interesting and motivating to enjoy the learning process are effective learning methods for students. Diah et al., (2023) suggests the "gasing" mathematics learning method is an approach that emphasizes learning through real exploration of the material being taught. In this method, the process of learning mathematics does not only depend on the theory or formula conveyed by the teacher, but also involves the use of concrete objects or props to help students understand concepts more deeply[5] argues, the "gasing" method is a mathematics learning approach designed to make it easier for children to master mathematics in a simple, interesting, and fun way. The use of this method helps students learn math in a simpler and more fun way.

Based on previous research, it can be seen that "spinning top" learning has succeeded in improving student learning achievement. With the application of the "top" method, it makes an interactive learning process that allows students to master mathematical material during the learning process, the "top" method provides an exciting and useful math learning experience for students[6] . "Gasing" learning also has an influence on the results of increasing student learning[7] . One important aspect of supporting this learning is learning media.

Learning media is an important aspect in learning activities. In the learning process, the media serves as a means for teachers to convey material so that it is easily understood by students. The use of learning media in the education process can encourage student interest and motivation in learning. This is in line with research[8] utilization of appropriate learning media can increase interaction in the learning process, so that students do not feel bored. In addition, students also enjoy using the media more because it can help improve the quality of their learning outcomes. As a teacher support tool, media can make learning more interesting and make it easier for students to understand mathematics material. The role ofmedia is very important to make the learning process more varied and creative. Therefore, learning media needs to be utilized optimally by utilizing existing advantages and overcoming obstacles in learning[9] . One of the tools that can support the learning process is flashcard media. Flashcards are learning media in the form of cards equipped with images and brief explanations, useful for reading and counting media for students(Nafi'ah et al., 2023) . This media helps students in improving various aspects(Wahyuni, 2020) . Research conducted byLoflin & Plaster (2020) states that many researchers prove that the use of flashcards is not only for remembering letters but for a fairly effective student counting aid. Research conducted byPutri & Dewi (2020) proves that number block media helps students to better understand the material in math lessons. Number blocks also play a role in improving students' ability to determine the result of addition[14]

Thus, the use of flashcards and number blocks can make it easier for students to understand the material in a simpler and more concrete way and increase their interest in the learning process. Some previous studies have shown that flashcards are effective in improving children's ability to count and attracting students to enjoy learning math. Therefore, researchers want to combine two media for learning math, namely flashcards and number blocks.

Previous research revealed that the "gasing" method in learning mathematics is effective in improving students' understanding and learning outcomes, while flashcard media can improve students' numeracy skills. However, this study has a different focus, namely combining math "gasing" learning using flashcards and number blocks for students with disabilities. Thus, the purpose of this study is to examine the effectiveness of learning math using the "gasing" method with flashcards and number blocks for students with dyscalculia.

II. RESEARCH METHODS

This research uses a quantitative approach with a single subject experimental design (Single Subject Research). This type of research focuses on the impact of repeated administration of independent variables on the dependent variable, where data are analyzed individually is single subject research[15] . The design applied in this study is the A-B-A design. This design consists of three phases, namely phase A1 as baseline, phase B as treatment, and phase A2 after experimental treatment. Phase A1 is the initial

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

condition in which the measurement of the target is carried out in a natural situation before the intervention is carried out. Phase B is a condition in which a new intervention or treatment is applied. While phase A2 repeats the baseline condition to evaluate whether the changes that occur during phase B can be maintained or stabilized.

The technique applied in this research is purposive sampling technique, which is a method with sample selection based on certain criteria or objectives desired by the researcher. The subjects used in the study were grade 2 dyscalculia students at SD Negeri 01 Klodran. The data obtained in the form of scores in the form of percentages. The written test consists of 10 questions. The percentage score is presented in graphical form according to each phase, then analyzed using visual bar graphs.

The data collection instrument in this study was a description test. Descriptive statistics were used to analyze the data, while hypothesis testing was conducted using the Wilcoxon Signed-Rank Test. This test aims to measure the effectiveness of learning math "spinning" using flashcards and number blocks for students with dyscalculia.

Ho: There is no significant improvement in the ability of students with dyscalculia after being given a math "top" learning using flashcards and number blocks.

Ha: There is a significant improvement in the ability of students with dyscalculia after being given a math "top" lesson using flashcards and number blocks.

III. RESULTS AND DISCUSSION

Research on the effectiveness of learning math "spinning" using flashcards and number blocks as learning media for students with dyscalculia. Conducted on grade 2 dyscalculia students totaling 5 students at SD N 01 Klodran who meet the criteria of dyscalculia children (1) the child is still wrong in writing the sign of mathematical operations, (2) the child is still wrong with the results of calculating addition and subtraction, (3) the child has not been able to do the calculation activity of calculating addition and subtraction of saving and borrowing, (4) the child does not remember the meaning of solving the calculation problem of addition and subtraction stacking down

Before conducting the Wilcoxon Signed-Rank Test, the data obtained will be analyzed first through descriptive tests, normality tests, and homogeneity tests. Descriptive tests are used to analyze the pre-test and post-test results of students with dyscalculia.

Table 1. Wilcoxon Signed-Rank Test Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Class	Pretest	32	5	10,95	4,90
	Posttest	66	5	8,94	4,00

Based on Table 1. Baseline Phase A1 the mean score was 32 with a standard deviation of 10.95 and a standard error of mean of 4.90. This shows the initial condition of students on the math test before the "spinning top" treatment is given. Then in the Treatment B phase the measurements taken during this phase showed the students' scores when they received the "topsy-turvy" learning method. the scores in this phase which were higher than the baseline indicated that the method had a positive effect when applied. Then in Phase A2 it was seen that the mean score increased to 66 with a standard deviation of 8.94 and a standard error of the mean of 4.00. This increase compared to the baseline phase indicates an improvement in students' math skills after the treatment, even after the "gasing" method was stopped. The lower standard deviation in phase A2 compared to A1 indicates an increase in the consistency of student results. These results indicate that the "spinning top" learning was successful in improving the math skills of students with dyscalculia. The improvement effect that persisted after the treatment phase was over showed that the method had a long-term impact on students' learning.

Table 2. Wilcoxon Signed-Rank Test

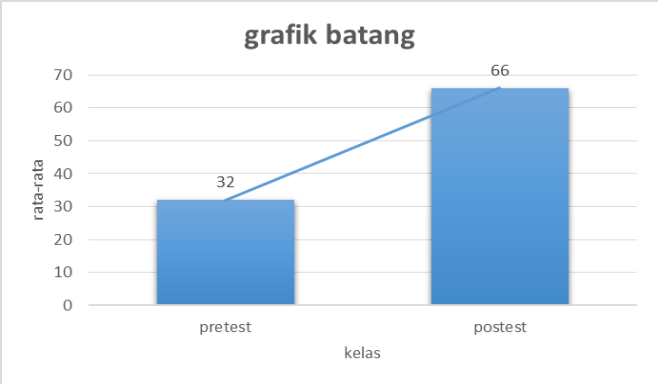
		Paired difference	t	df	Sig. (2-tailed)
		Mean			
Class	Pretest	34	-2,070	5	0,038
	Posttest				

Based on the Wilcoxon Signed-Rank Test results presented in the table above, the significance value of 0.038 is smaller than 0.05, so the null

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. These results indicate that the "gasing" learning method has a significant effect in improving the math skills of students with dyscalculia

Table 3. Graph of Average Pretest Posttest



Based on the graph above, it can be seen a comparison of the average pre-test score in the A1 baseline phase and the post-test in the A2 phase after the experiment in the class that followed the "gasing" learning method for students with dyscalculia. The average pre-test score is 32 indicating the initial condition of students before receiving treatment. This score is the basis for comparing the results after treatment, aiming to assess the effectiveness of the method used. The average post-test score increased to 66 after students underwent learning with the "gasing" method using flashcards and number blocks. This shows a significant improvement in students' abilities.

The increase from 32 to 66 illustrates that this learning method has a considerable positive effect on the math skills of students with dyscalculia. The effectiveness of the method is also evident from the increase in the average score from pre-test to post-test by 34 points, indicating that the "spinning top" learning method is effective. Visually, the bar graph shows a marked difference between the pre-test and post-test scores, which supports the interpretation that the method had a significant positive impact. These results show that the learning method helps students improve their math skills, which is consistent with the hypothesis that the "spinning top" method using flascards and number blocks is effective for students with dyscalculia.

In this study, the effectiveness of learning math "spinning" using flashcards and number blocks for students with dyscalculia was analyzed. Based on the results of statistical analysis, a significant improvement was found. These results are supported by research that reinforces the theory that interactive and interesting learning approaches, such as the "spinning top" method, can overcome learning barriers in students with special needs, in this case students with dyscalculia. In the "spinning top" method, the learning process is made more fun and not scary, so students are more motivated to learn. This is in line with the views of[16] and[5] which state that the "gasing" method aims to make math feel "Easy, Fun, and Fun," which in turn helps students build a deeper understanding of mathematical concepts. Teacher expertise in combining methods, models, or strategies in the learning process plays an important role in achieving optimal educational goals, which in turn affects student success in understanding mathematics[17]

The application of the "gasing" method has a positive impact on improving mathematics learning achievement[18] improving students' understanding of procedures related to the perimeter and area of flat shapes material(Sari et al., 2019) , tutoring using the "gasing" method has proven effective in improving learning outcomes and reducing learning loss caused by the Covid-19 pandemic. (Nasrulah et al., 2020) . Research conducted bySunarti (2021) revealed that the application of mathematics learning methods using the "gasing" method can improve the achievement of student learning outcomes at SDN 3 Gandusari. These results are consistent with the findings of the studyKusuma, Jampel, & Bayu (2019) showing a significant difference in math learning outcomes between grade III students who used the "gasing" method and those who did not.

The results of this study are also in line with the findings of a study conducted byDiah & Siregar (2023) This study revealed that the application of the TGT learning model modified by the "gasing" method had an effect on students' mathematics learning outcomes, this can be seen from the difference in the learning outcomes of third grade elementary school students before and after the application of the learning model. This finding is in accordance with the results of research conducted

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

byDelima (2019) which changes TGT learning with the "spinning top" method. Motivation, which is often considered "spirit" in society, has an important role in determining learning success. According to the theory of Hamzah B. Uno. inRahman (2021) learning motivation arises due to internal factors such as desire and enthusiasm for success, as well as encouragement from the need to learn, hopes, and ideals. Meanwhile, external factors include rewards, a supportive environment, and interesting and fun activities.

Student learning outcomes refer to the abilities obtained by students after they have participated in the learning process, both at school, family, and society[25] . The success of this method in improving the consistency of learning outcomes is indicated by the decrease in standard deviation from the baseline phase to the post-test phase. Also in line with previous research findings, learning that involves interaction using visual aids, such as flashcards and number blocks, which can make it easier for students to understand abstract mathematical concepts, which are often a challenge for students with dyscalculia. This is as explained byRohima (2023) the selection of appropriate learning media can encourage students' learning motivation and make it easier for them to understand the material being taught.

In addition, the consistent improvement of students' results after the application of the "topsy-turvy" method also shows that this method not only supports students in the short term, but also provides a sustainable positive impact. This can be seen from the increase in scores that remained significant even after the intervention phase ended. Thus, the "spinning top" method can be considered as an approach that has the potential to provide a long-term impact for students with dyscalculia in understanding and mastering the basics of mathematical concepts.

Negative attitudes towards subjects can result in difficulties in the learning process or produce suboptimal results(Hasibuan et al., 2022) . Practically, the findings of this study have important implications for teaching mathematics in primary schools, especially for students who face learning difficulties, such as dyscalculia. Teachers can implement the "gasing" method with flashcards and number blocks as an alternative to more inclusive and adaptive learning. This is supported byLestari & Sholichah (2023) in his research, found a significant increase in the ability of children with Autism Spectrum Disorder (ASD) before and after attending therapy using flashcards. Flashcards are learning tools or media in the form of cards containing images, with an explanation of the image listed on the back of the card(Wahyuni, 2020) . With this approach, it is expected that students who have difficulty learning mathematics can follow the lesson better, and get a significant improvement in their mathematics skills

Overall, this study shows that the "gasing" method using flashcards and number blocks is effective in overcoming math learning challenges in students with dyscalculia. The application of this method can be considered as a learning approach

that can be adapted for other subjects, or further developed to refine learning strategies for students with other special needs. Classroom action research is a method applied to overcome problems that arise in the teaching and learning process carried out by teachers in the classroom, with the aim of improving student learning achievement(Pujiati, 2021)

IV. CONCLUSION

The results of this study concluded that the application of the "gasing" learning method applied to students with dyscalculia proved effective in improving their math skills. This is evidenced by the statistical analysis which showed an increase in the mean score from the initial phase (baseline) of 32 to 66 in the final phase after treatment, with a lower standard deviation, which reflects more consistent results. The use of flashcards and number blocks in the "gasing" method has a significant positive impact on improving students' math skills, in accordance with the proposed hypothesis. The results of the Wilcoxon Signed-Rank Test also support this finding, with a significance value of 0.038 indicating that the improvement was not accidental. Overall, the "spinning top" learning method proved to be effective and had a long-term impact on improving the math skills of students with dyscalculia.

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

REFERENCES

[1] C. I. S. Budhayanti, "Pelatihan Pengembangan Media Matematika Bagi Guru Sekolah Dasar Mardi Waluyo Sindanglaya Cianjur J," *J. Bakti Masy. Indonesia*, 2020.

[2] K. F. Patricia, F. A., & Zamzam, "Diskalkulia (Kesulitan Matematika) Berdasarkan Gender Pada Siswa Sekolah Dasar Di Kota Malang.," *Jurnal Program Studi Pendidikan Matematika*, Vol. 8, No. 2, P. 288, 2019.

[3] & M. Sulistyo Nugroho, W., "Pemetaan Anak Berkebutuhan Khusus Pada Sekolah Inklusi Melalui Program Identifikasi Dan Asesmen," *Jurnal Pendidikan Dasar Flobamorata*, Vol. 2, No. 1, Pp. 111–117, 2021.

[4] N. Diah, R., & Siregar, "Pengaruh Model Pembelajaran Tgt (Teams Games Tournament) Modifikasi Metode Gasing Terhadap Hasil Belajar Matematika Siswa," *Edukasia: Jurnal Pendidikan Dan Pembelajaran*, Vol. 4, No. 2, Pp. 1033–1042, 2023.

[5] Aprijon, "Pelatihan Matematika Gasing Pada Materi Pelatihan Matematika Gasing Pada Materi Pelatihan Matematika Gasing Pada Materi.," *Jurnal Ilmu Pengetahuan Dan Pengembangan Masyarakat Islam*, Pp. 47–48, 2020.

[6] R. D. Alianti And V. Febrianty, "Pengaruh Pembelajaran Matematika Metode Gasing Terhadap Hasil Belajar Penjumlahan Bilangan Cacah Siswa Kelas 3 Sd," No. 4, 2024.

[7] A. W. (N. D.) Wibowo, "Meta-Analisis Pengaruh Metode Gasing Pada Pembelajaran Matematika Sd Dalam Meningkatkan Hasil Belajar Siswa," *Jurnal Pendidikan Guru Sekolah Dasar*, Pp. 142–148, 2022.

[8] N. Rohima, "Penggunaan Media Pembelajaran Untuk Meningkatkan Keterampilan Belajar Pada Siswa," *Publikasi Pembelajaran*, Vol. 1, No. 1, Pp. 1–12, 2023.

[9] Z. Sari, I. P., Sari, M. N., & Miftah, "Pelatihan Membuat Media Pembelajaran Interaktif Berbasis Teknologi Informasi," *Jurnal Pkm Pengabdian Kepada Masyarakat*, Vol. 2, No. 02, P. 119, 2019.

[10] M. Nafi'ah, I., Alfi, C., & Fatih, "Pengembangan Media Flashcard Berbasis Crossword Puzzle Untuk Meningkatkan Motivasi Belajar Siswa Kelas Iv," *Jurnal Ilmiah Pendidikan Dasar*, Vol. 8, No. 1, Pp. 5726–5737, 2023.

[11] S. Wahyuni, "Penerapan Media Flash Card Untuk Meningkatkan Hasil Belajar Tema 'Kegiatanku,'" *Jurnal Ilmiah Sekolah Dasar*, Vol. 4, No. 1, P. 9, 2020, Doi: 10.23887/Jisd.V4i1.23734.

[12] M. Loflin, L., Vargo, Kk, & Plaster, "Jurnal Daring Untuk Pendidik Literasi 2020," *Jurnal Pendidik Literasi*, Vol. 5, No. 8, Pp. 1–28, 2020.

[13] S. Putri, A. Y., & Dewi, "Stimulasi Kemampuan Mengenal Konsep Bilangan Anak Usia Dini Melalui Permainan Matematika Montessori," *Jurnal Pendidikan Tambusai*, Vol. 4, No. 1, Pp. 488–499, 2020.

[14] P. Alvyenti, "Efektivitas Media Balok Angka Dalam Meningkatkan Kemampuan Penjumlahan Bilangan Bulat Puluhan Bagi Anak Attention Deficit Hyperactivy Disorder," *Jurnal Penelitian Pendidikan Kebutuhan Khusus*, Vol. 11, No. 1, Pp. 1–9, 2023.

[15] Marlina, "Single Subject Research: Penelitian Subjek Tunggal," *Raja Grafindo Persada*, 2021.

[16] M. W. K. Kusuma, "Pengaruh Metode Pembelajaran Matematika Gasing Terhadap Hasil Belajar Matematika," *Jurnal Pedagogi Dan Pembelajaran*, P. 43, 2018.

[17] R. Mawaddah, M., & Siswanto, "Development Of E-Worksheet To Improve Students Mathematical Problem Solving Ability: Pengembangan E-Lkpd Untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Peserta Didik," *Mathline: Jurnal Matematika Dan Pendidikan Matematika*, Vol. 4, No. 2, Pp. 79–85, 2022.

[18] B. Kusumam, M., & Hasan, "Pengembangan Media Pembelajaran," *Al-Ahya*, Vol. 1, No. 1, Pp. 219–232, 2019.

[19] A. Sari, N., Hidayat, W., & Yuliani, "Analisis Hasil Belajar Matematika Siswa Kelas X Sma Pada Materi Spltv Ditinjau Dari Self-Efficacy.," *Union: Jurnal Pendidikan Matematika*, Vol. 7, No. 1, Pp. 93–103, 2019.

[20] R. Nasrulah, D., Natsir, M., Siswanto, & Lilis, "Ata Riset Dan Teknologi Covid-19

Volume 09, Number 01, Page 186-202
e-ISSN: 2598-120X; p-ISSN: 2598-117X

Indonesia.," *Jakarta: Kementerian Riset Dan Teknologi - Badan Riset Dan Inovasi Nasional Republik.*, 2020.

[21] Sunarti., "Peningkatan Hasil Belajar Siswa Pada Mata Pelajaran Matematika Dengan Menggunakan Metode Pembelajaran Matematika Gasing Di Sekolah Dasar.," *Tanggap: Jurnal Riset Dan Inovasi Pendidikan Dasar*, Vol. 2, No. 1, Pp. 29–38, 2021.

[22] G. Kusuma, M., Jampel, I., & Bayu, "Pengaruh Metode Pembelajaran Matematika Gasing Terhadap Hasil Belajar Matematika.," *Jurnal Pedagogi Dan Pembelajaran*, Vol. 1, No. 1, P. 37, 2019.

[23] I. Delima, "Pengaruh Model Pembelajaran Tgt (Teams Games Tournament) Modifikasi Metode Gasing Terhadap Kemampuan Pemecahan Masalah Matematis Peserta Didik Kelas Vii Smp Negeri 36 Bandar Lampung," *Universitas Islam Negeri Raden Intan Lampung*, 2019.

[24] S. Rahman, "Pentingnya Motivasi Belajar Dalam Meningkatkan Hasil Belajar," *Merdeka Belajardalam Menyambut Era Masyarakat 5.0, (November)*, Pp. 289–302, 2021.

[25] A. Setiawan, "Efektivitas Penggunaan Model Pembelajaran Probing-Prompting Terhadap Hasil Belajar Siswa Tema Lingkungan Sahabat Kita Di Kelas V Sekolah Dasar," *Jurnal Pendidikan Dasar Nusantara*, Vol. 7, No. 1, Pp. 1–16, 2021.

[26] U. Hasibuan, R., Fitri, R., & Dewi, "Steam-Based Learning Media: Assisting In Developing Children's Skills.," *Jurnal Pendidikan Anak Usia Dini*, Vol. 6, No. 6, Pp. 6863–6876, 2022.

[27] I. Lestari, R., & Sholichah, "Efektivitas Terapi Bermain Flash Card Untuk Meningkatkan Kemampuan Komunikasi Pada Anak Autism Spectrum Disorder (Asd)," *Jurnal Ilmiah Ips Dan Humaniora*, Vol. 1, No. 3, Pp. 80–89, 2023.

[28] S. Wahyuni, "Penerapan Media Flash Card Untuk Meningkatkan Hasil Belajar Tema 'Kegiatanku'.," *Jurnal Ilmiah Sekolah Dasar*, Vol. 4, No. 1, Pp. 9–16, 2020.

[29] Pujiati., "Peningkatan Prestasi Belajar Matematika," *Jurnal Pendidikan Dewantara*, Vol. 7, No. 1, Pp. 1–8, 2021

Volume 00, Number 00, _____ 0000
p-ISSN: 2598-117X ; e-ISSN: 2598-120X