Effect of Active Knowledge Sharing Strategy on Learning Outcomes of Students with Hearing Impairment in Learning Fractions

Dira Rosalia Nurkholifah[1*]; Riksma Nurahmi Rinalti Akhlan[2]; Tati Hernawati[3]

[1,2,3]Special Education, Universitas Pendidikan Indonesia, Indonesia
[1]Corresponding Email: dirarosalia5@upi.edu, Phone Number: 0831 xxxx xxxx*

Article History:
Received: Apr 05, 2025
Revised: Apr 18, 2025
Accepted: May 22, 2025
Online First: Jun 22, 2025

Keywords:
Active Knowledge Sharing Strategy,
Children with Hearing Impairment,
Fraction,
Learning Outcomes.

Kata Kunci:
Anak dengan Hambatan Pendengaran,
Hasil Belajar,
Pecahan,
Strategi Berbagi Pengetahuan Aktif.

How to cite:
Nurkholifah, D. R., Akhlan, R. N. R., & Hernawati, T. (2025). Effect of Active Knowledge Sharing Strategy on Learning Outcomes of Students with Hearing Impairment in Learning Fractions. *Edunesia : Jurnal Ilmiah Pendidikan, 6*(2), 1199-1210.

This is an open-access article under the CC-BY-NC-ND license

Abstract: The low understanding of basic fraction concepts among students with hearing impairment has led to difficulties in writing fractional numbers and performing addition and subtraction of fractions. This study aims to examine the effect of the active knowledge-sharing strategy on the learning outcomes in fractions of students with hearing impairment at SLBN Cicendo, Bandung City, specifically in writing simple fractions and performing addition and subtraction fractions with like denominators. This research used an experimental method using a one-group pretest-posttest design. The subjects were six students from Class VIII-A1 with hearing impairment. Data were collected through pretests and post-tests post-tests and analyzed using the Wilcoxon Signed Rank Test. The results showed that the average post-test score was higher than the average pretest score. The most significant improvement was observed in the indicator for calculating the addition and subtraction results of common fractions with like denominators. In contrast, the lowest improvement was found in the indicator for writing simple fractions using concrete and semi-concrete media.

Abstrak: Rendahnya pemahaman anak tunarungu terkait konsep dasar pecahan, berdampak pada kesulitan anak tunarungu dalam menuliskan bilangan pecahan serta menghitung hasil penjumlahan dan pengurangan pecahan. Penelitian ini untuk mengetahui bagaimana pengaruh strategi active knowledge sharing terhadap hasil belajar pecahan pada anak tunarungu di SLBN Cicendo Kota Bandung, yaitu menuliskan bilangan pecahan sederhana serta penjumlahan dan pengurangan pecahan dengan penyebut sama. Metode penelitian yang digunakan yaitu metode eksperimen dengan one group pretest-posttest design. Subjek pada penelitian ini anak tunarungu kelas VIII-A1 yang berjumlah 6 orang. Pengambilan data dilakukan melalui pretest dan posttest, dilakukan teknik analisis data yaitu Wilcoxon Sign Rank Test. Hasil penelitian menunjukkan nilai rata-rata posttest lebih besar dibandingkan nilai rata-rata pretest. Peningkatan tertinggi terdapat pada indikator menghitung hasil penjumlahan dan pengurangan pecahan biasa dengan penyebut sama, sedangkan peningkatan terendah terdapat pada indikator menuliskan bilangan pecahan sederhana dengan media konkret dan semi konkret.

https://doi.org/10.51276/edu.v6i2.1246

A. Introduction

All learning activities should be oriented toward achieving educational goals by considering children's needs, the competencies they are expected to achieve, and the effectiveness of the learning implementation itself. Essentially, the learning process involves providing stimuli to children to elicit positive responses. In other words, the learning process can be defined as a change in behavior resulting from an individual's experience and interaction with their environment. This highlights the significant role of environmental factors or external influences in providing stimuli that support children's learning processes. The success or failure of learning in achieving its goals greatly depends on the quality of the learning process. An effective learning process will lead to optimal learning outcomes, and the methods used during learning play a crucial role in determining success. Particularly in the context of formal education, every child, regardless of economic background, ethnicity, religion, race, or other conditions, has equal rights and opportunities to access education, including children with special needs.

Children with special needs possess unique characteristics that distinguish them from typically developing children. These unique traits necessitate specific educational services tailored to their learning requirements. Among the various types of special needs, one group includes students with hearing impairment. Sutjihati (Badriyah & Pasmawati, 2020) argues that a child with hearing impairment is someone who experiences a lack or loss of hearing ability either wholly or partially due to the partial or complete malfunction of the hearing device so that he cannot use his hearing device in everyday life which has an impact on his life in a complex manner. Pedagogically, hearing impairment refers to a deficiency or loss of hearing that hinders a child's development and thus requires exceptional guidance and education. This opinion is the same as the opinion conveyed by Irdamurni (2019), where children with hearing impairment are children who lose all or part of their hearing power so that they are less able to communicate verbally even though they have been given help with hearing aids still require special education services. Nevertheless, these characteristics and needs do not diminish the rights and opportunities of students with hearing impairment to access education equivalent to that of their typically developing peers.

Mardapi (in Djonomiarjo, 2019) states that the quality of the learning process determines learning outcomes because learning outcomes are an ability or skill possessed by the student experiencing learning activities. According to Utami & Cahyono (2020), mathematics is considered an enjoyable subject for students; however, in reality, many students still struggle to teach it. This view is supported by Fauzy & Nurfauziah (2021), who stated that mathematics is a fundamental discipline. However, many students perceive it as a complex subject, often leading them to give up even before attempting to teach it. These difficulties in learning mathematics are also experienced by students with hearing impairment. Due to their reduced or absent hearing ability, even when provided with stimuli, they may still be unable to fully perceive or respond to the information. This can hinder their development and affect various aspects of their lives, making providing exceptional guidance and educational services necessary.

https://doi.org/10.51276/edu.v6i2.1246

Fractions involve numerous rules, such as axioms, definitions, theorems, formulas, and algorithms, leading to conceptual misunderstandings among students who do not master these components (Saputri, 2021). This becomes a challenge for students with hearing impairment during the mathematics learning process, as mathematics is filled with symbols with specific meanings. Furthermore, many of these mathematical symbols do not yet have standardized representations in sign language that are understood by students with hearing impairment (Nurhabibah et al., 2023). These difficulties in understanding mathematical symbols may decrease learning motivation, especially if the learning approach and strategies are ineffective.

Based on interviews and observations conducted at SLBN Cicendo, Bandung City, various problems were identified in mathematics learning, both in fraction material and other topics. The issues found included difficulties among students with hearing impairment in understanding the basic concepts of fractions, challenges in translating mathematical sentences into fractional notation, and the inability of some students to solve addition and subtraction problems involving fractions.

More specifically, students with hearing impairment in Class VIII-A1 at SLBN Cicendo experienced difficulties writing simple fractions based on their observations of provided concrete objects. Their understanding of numerators and denominators had not yet developed, resulting in frequent errors in writing fraction symbols. Similarly, students struggled to determine the denominator in a fractional number when using semi-concrete and semi-abstract media. Although the students could calculate the numerator, they often failed to include the counted parts in the denominator, indicating a lack of comprehension of the basic fraction concept. This limited understanding led to further difficulties in writing fractional numbers correctly. About the Merdeka Curriculum implemented at SLBN Cicendo, specifically the Learning Outcomes for Special Education in Mathematics, Phase D, Number Element, students at the lower secondary special needs level are required to learn fractions up to the stage of calculating the results of addition and subtraction with like denominators. Therefore, improving students' abilities in understanding fractions is necessary to support their future mathematics learning needs.

In addition, issues were also found in the learning process, particularly in the teaching method applied by the teacher, which relied on the lecture method. However, several students in the class had a short attention span and were easily distracted. The participation of students with hearing impairment during learning was minimal, as indicated by their lack of initiative to engage in discussions by asking or answering questions unless prompted by the teacher. Moreover, using the lecture method often led to boredom among students with hearing impairment due to the predominantly one-way communication from teacher to student. Students tend to feel more satisfied and comfortable when the teaching methods used by the teacher align with their expectations (Sholikhah & Wahidah, 2021).

These problems indicate the need to implement an active learning strategy to improve fraction learning outcomes in students with hearing impairment by addressing

https://doi.org/10.51276/edu.v6i2.1246

their needs and learning challenges. According to Silberman (2018), in the initial moments of active learning, there are three important goals to achieve, including 1) team formation, 2) simple assessment, and 3) direct learning engagement. If these three objectives can be achieved, this will go a long way in creating a learning environment that engages students and increases their desire to participate in the learning process.

The active knowledge-sharing strategy was chosen as an appropriate instructional approach, considering the characteristics of students with hearing impairment who often struggle to acquire information, especially when the learning material is delivered in a classical format. The objectives of the active knowledge-sharing strategy include developing the ability to act skillfully in various situations, developing an attitude to listen and respond to something, discussing problems, formulating problems and solving them, and solving problems (Dalimunthe et al., 2018). Implementing the active knowledge-sharing strategy is expected to enhance the quality of communication during the learning process, as it provides opportunities for more intensive personal and group discussions. This assumption is supported by the notion that through the active knowledge-sharing strategy, students with hearing impairment can ask questions, seek clarification, and request repeated material they do not understand more freely. This contrasts with the lecture method, where students generally have fewer opportunities to ask questions and engage in discussions due to the one-directional nature of communication from teacher to student. Therefore, the active knowledge-sharing strategy is expected to facilitate students' understanding of the learning material. In addition to considering the characteristics of students with hearing impairment, this strategy was also selected based on the objective condition of Class VIII-A1 students during classroom learning, who tended to be passive and lacked active participation in responding. These students would only respond when directly questioned by the teacher and showed little initiative to ask questions or express confusion about the learning material. In this context, the active knowledge-sharing strategy is considered suitable for the subjects' needs, as it encourages active and interactive participation and helps build students' confidence in expressing questions or confusion through a learning design that requires every student to initiate peer questioning.

This study aims to examine the effect of the active knowledge-sharing strategy on the learning outcomes in fractions of students with hearing impairment at SLBN Cicendo, Bandung City, specifically in writing simple fractions and performing addition and subtraction fractions with like denominators.

B. Method

This study aimed to examine the effect of the active knowledge-sharing strategy on the learning outcomes in fractions of students with hearing impairment. A quantitative approach with an experimental method was used in this research. The research design used was pre-experimental in the form of a One-Group Pretest-Posttest Design. The data collection technique used is a written test to measure the knowledge of children with hearing impairment related to fraction material in mathematics subjects. Written tests given

https://doi.org/10.51276/edu.v6i2.1246

before and after treatment (pretest and post-test post-test) are the same questions to compare students' fraction learning outcomes before and after treatment by applying active knowledge-sharing strategies. The instruments used in this research include fraction material assessment instruments consisting of 40 short essays and multiple-choice questions. As for data analysis techniques, this study uses non-parametric techniques, namely the Wilcoxon Sign Rank Test. The subjects of this study were six students from Class VIII-A1 at SLBN Cicendo, Bandung City, in the 2023/2024 academic year. In this research, the independent variable was the active knowledge-sharing strategy, while the dependent variable was the fraction of students with hearing impairment learning outcomes. The study was conducted at SLBN Cicendo, located at Jl. Cicendo No. 2, Babakan Ciamis, Sumur Bandung District, Bandung City, West Java.

In this study, a two-tailed statistical hypothesis was formulated to determine the effect of the active knowledge-sharing strategy on the fraction learning outcomes of students with hearing impairment. The hypotheses are stated as follows:

- Null Hypothesis (H_0): There is no statistically significant difference between students' pretest (O_1) and post-test post-test (O_2) scores. (H_0: $O_1 = O_2$)
- Alternative Hypothesis (H_1): There is a statistically significant difference between students' pretest (O_1) and post-test post-test (O_2) scores as a result of the implementation of the active knowledge-sharing strategy. (H_1: $O_1 \neq O_2$)

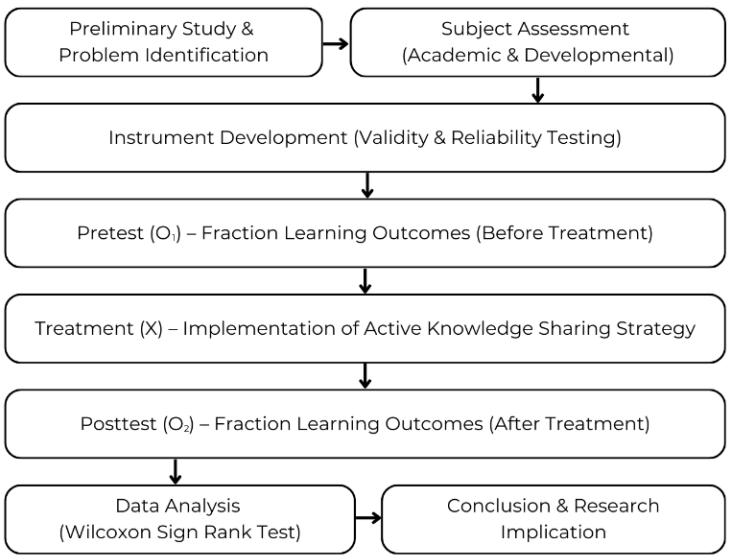

Figure 1. Research Flow

C. Result and Discussion

Result

After the pretest was conducted, it was found that the scores obtained by each subject varied. The test items consisted of 2 questions on writing simple fractions using concrete media, six questions using semi-concrete media, eight questions using semi-abstract media,

https://doi.org/10.51276/edu.v6i2.1246

six questions on writing simple fractions abstractly, nine questions on solving addition problems with like denominators, and nine questions on solving subtraction problems with like denominators. The scoring criteria were 0 for incorrect answers and 1 for correct answers, resulting in a maximum possible score of 40. Based on the post-test post-test results, all subjects showed improvement in their fraction learning outcomes, with most of them achieving near-perfect scores. The following graph presents the score distribution.

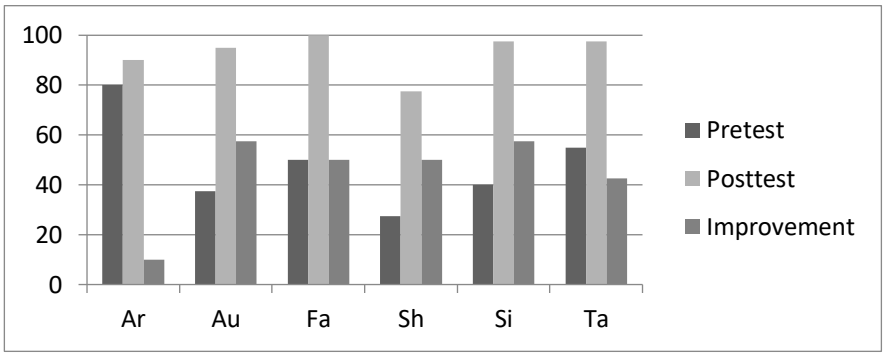

Figure 2. Comparison of Pretest-Posttest Results Per Subject

To find out the average increase in fraction learning outcomes after being given treatment in the form of an active knowledge-sharing strategy on each indicator, an analysis of the scores obtained by the subject in each indicator is carried out. The following table contains the acquisition of scores, average scores, and increased subject scores per indicator.

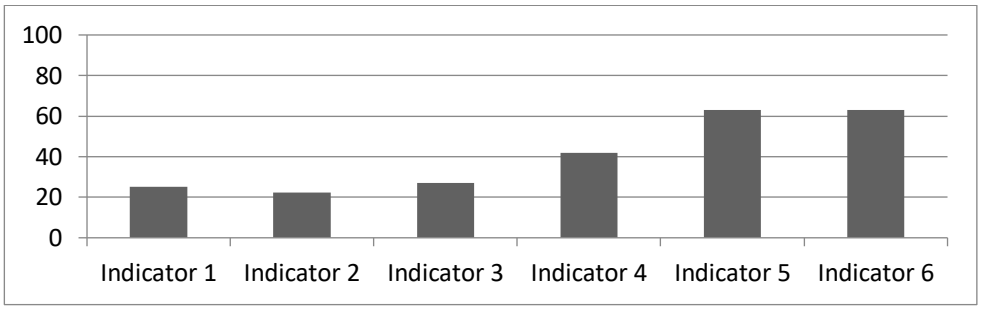

Figure 3. The Average Increase in Fraction Learning Outcomes Per Indicator

As shown in Figure 3, the subjects experienced consistent improvement across all indicators. Indicators V and VI observed the highest score increases, which assessed students' ability to calculate the addition and subtraction results of common fractions with like denominators. In the pretest, before the treatment was administered, most subjects obtained scores categorized as very low. However, after applying the active knowledge-sharing strategy, the subjects experienced a significant increase in scores, with the majority achieving scores categorized as very good.

Based on the data obtained from the pretest and post-test post-test results, further analysis was conducted using the Wilcoxon signed-rank test. The Wilcoxon test aimed to

https://doi.org/10.51276/edu.v6i2.1246

examine the differences between paired data, compare observations before and after the treatment, and determine the treatment's effectiveness (Windi et al., 2021).

Table 1. Results of Data Analysis with Wilcoxon Sign Rank Test

		N	Mean Rank	Sum of Ranks
Post-test post-test - Pretest	Negative Ranks	0[a]	.00	.00
	Positive Ranks	6[b]	3.50	21.00
	Ties	0[c]		
	Total	6		

The interpretation of the above output is negative ranks, or the negative difference between the initial fraction learning outcomes on the pretest and the final fraction learning outcomes on the test post, which is 0 in the N value, mean rank, and sum of ranks. The zero value indicates no decrease or reduction from the pretest value to the test post value.

Positive ranks, which refer to the positive differences between pretest and post-test post-test scores, showed that all six subjects (N = 6) experienced increased scores. The mean rank, or the average magnitude of the increase, was 3.50, while the sum of positive ranks was 21.00.

Ties refer to identical values in the pretest and test post scores. Based on the output data, the value of ties was 0. This indicates no identical scores between the pretest and test post. The statistical test results are presented below.

Table 2. Test Statistics

	Post-test post-test - Pretest
Z	-2.214[b]
Asymp. Sig. (2-tailed)	.027

After conducting data analysis, hypothesis testing is also necessary in a study. The purpose of hypothesis testing is to evaluate the validity of a proposed hypothesis in the research. According to the test statistics output, the Asymp. Sig. (2-tailed) The value was 0.027. Since 0.027 is smaller than 0.05, it can be concluded that the alternative hypothesis (Ha) is accepted, indicating a significant difference between the initial fraction learning outcomes in the pretest and the outcomes in the post-test post-test. This leads to the conclusion that the implementation of the active knowledge-sharing strategy had a significant effect on the fraction learning outcomes of students with hearing impairment at SLBN Cicendo, Bandung City.

In the initial condition before the treatment was given, several subjects already indicated a sufficient understanding of writing simple fractions using concrete, semi-concrete, semi-abstract media, and abstract representation. This was evident from the pretest scores on Indicators I, II, III, and IV, which showed average scores of 66.6, 63.8, 72.9, and 58.2, respectively. However, the subjects still experienced difficulties calculating common fractions' addition and subtraction results with like denominators, as reflected in

https://doi.org/10.51276/edu.v6i2.1246

the average pretest scores on Indicators V and VI, which were 29.6 and 24, respectively. Learning outcomes vary from one learner to another. The difference is caused by factors that influence it, including factors that come from themselves and factors that come from outside the learners (Nabillah & Abadi, 2019).

Before the treatment was administered, it was found that the subjects often made errors when writing simple fractions based on the presented objects or images. This occurred because the subjects could apply counting techniques to determine the numerator, but when identifying the denominator, they often failed to include the portion already counted as the numerator. As a result, the placement of numerators and denominators in fractional notation was frequently incorrect. In addition, most subjects could not solve addition and subtraction problems involving fractions with like denominators. This was indicated by the pretest responses in Indicators V and VI, where many subjects incorrectly added or subtracted the denominators of two fractions. For example, a subject solved 1/2 + 1/2 and answered 2/4.

Discussion

The problems found in the research subjects are by the conditions conveyed by Kushartina & Purbaningrum (2019), who explain that the difficulties of children with hearing impairment in mathematics lessons often occur at all age levels, one of which is in the material of fraction calculation operations. Murtiyasa & Wulandari (2020) said that fractions are a material in mathematics that students consider difficult. This statement is supported by Sutiarso (2019) research, which confirms that junior high school students have difficulty solving fraction problems. Haliza et al (2020) mentioned that special needs in communication also hinder the education and learning process of children with hearing impairment. In learning mathematics, students are required to hone their ability to communicate mathematical language orally and in writing in the form of illustrations, tables, diagrams, and depictions so that the information provided can be conveyed and understood by others clearly (Ramadina & Rosdiana, 2021; Janna et al., 2022).

Efforts to realize effective learning depend highly on how teachers can develop learning strategies and choose the right strategies in learning activities (Mulyono & Wekke, 2018). Based on field data obtained by the researcher, the implementation of the active knowledge-sharing strategy had a significant impact on the learning outcomes related to writing simple fractions and calculating the results of addition and subtraction of common fractions with like denominators. This can be observed in Table Figure 2, which shows improvements in the subjects' performance between the pretest (before treatment) and the post-test post-test (after treatment). This is the opinion of Surya & Fitri (2016), who explain that implementing learning with active knowledge-sharing strategies can help students in the learning process because this active knowledge-sharing strategy is active and can encourage students to improve student achievement. According to Syah in Damayanti (2022), the factors that influence learning outcomes can be divided into three types: internal factors (such as the physical and spiritual condition of students), external factors (such as

https://doi.org/10.51276/edu.v6i2.1246

environmental conditions around students), and learning approach factors or approach learning (namely the type of student learning effort including strategies and methods used by students to carry out learning activities). So, even though the subjects get the same treatment while applying the active knowledge-sharing strategy, the improvement in learning outcomes for individual subjects will undoubtedly be different.

The research results on students with hearing impairment showed increased learning outcomes, indicating that the active knowledge-sharing strategy can be applied to typically developing students and adapted to students with hearing impairment. This represents a new finding and an extension of previous research conducted by Halawati (2019), whose study showed that applying the active knowledge-sharing strategy significantly influenced students' mathematical comprehension. Her results revealed that this strategy enhanced mathematical understanding in the experimental group more than the problem-based learning strategy used in the control group. Furthermore, a study by Hendri et al (2023) found that using the active knowledge-sharing strategy increased students' interest in learning mathematics in Class VIII at SMPN 03 2x11 Kayutanam. Therefore, the results of this study suggest that teachers can use the active knowledge-sharing strategy to improve fraction learning outcomes in students with hearing impairment. The difficulty in calculating the results of addition and subtraction of fractions is supported by the opinion of Swaratifani & Budiharti (2021), which states that working on fraction calculation operations requires understanding concepts that are more complicated than other calculation operations.

The improvement in learning outcomes confirms the influence of the active knowledge-sharing strategy on the fraction learning achievements of students with hearing impairment. During the implementation of the treatment, the subjects could follow the learning steps explained by the researcher and actively engage in the learning process. Applying the active knowledge-sharing strategy is necessary to support student motivation for direct interaction, which can contribute to improved academic achievement, as stated by Ariasa et al. in Amin & Sumendap (2022).

Based on the description of the implementation of the active knowledge-sharing strategy in this study, it can be concluded that the strategy positively affected students' learning outcomes in fractions. In addition, using the active knowledge-sharing strategy made learning more meaningful, as the subjects could engage in discussions, explore concepts, and apply their understanding within their groups. This strategy also encouraged students to optimize their full potential, as the learning process was no longer teacher-centered. The results of this study indicate that teachers can use the active knowledge-sharing strategy to improve the fraction learning outcomes of students with hearing impairment, with several necessary adjustments.

This study showed five adjustments made while implementing the active knowledge-sharing strategy for students with hearing impairment. These included using a communication approach that was understandable for students with hearing impairment, conducting an initial apperception at the beginning of the lesson to confirm the topic to be

https://doi.org/10.51276/edu.v6i2.1246

discussed, explaining the steps of the learning process using the active knowledge-sharing strategy, forming groups according to the number of students and arranging seating positions to suit the needs of students with hearing impairment—ensuring proper face orientation and clear auditory access among group members—and carefully observing the subjects during the discussion process.

D. Conclusion

Based on the research, the active knowledge-sharing strategy significantly influenced the fraction learning outcomes of students with hearing impairment at SLBN Cicendo, Bandung City. Furthermore, the success of this strategy highlights the importance of adapting instructional approaches to accommodate the specific needs of students with hearing impairment, such as through clear visual cues, structured group settings, and modified communication techniques. Overall, this study affirms the potential of active knowledge sharing as an inclusive teaching strategy that improves academic achievement and promotes meaningful learning experiences for students with special educational needs.

The findings of this study have significant implications for inclusive mathematics instruction, particularly in supporting students with hearing impairment. The success of the active knowledge-sharing strategy in improving learning outcomes in fraction operations—especially in writing and calculating simple fractions—demonstrates that this approach is applicable to typically developing students and adaptable for those with communication-related special needs. The research highlights the importance of providing structured yet interactive learning environments where students with hearing impairment can actively engage in peer discussion, visual input, and collaborative problem-solving. Moreover, implementing this strategy required thoughtful adjustments in communication, group arrangements, and instructional scaffolding, underlining the necessity of teacher preparedness and sensitivity in inclusive classrooms.

In the implementation of this study, the researcher realizes that there are limitations and shortcomings both about the focus of research, which includes the subject of deaf children at SLBN Cicendo, and fraction material so that the results cannot be generalized to a broader population as well as to subjects or materials that have different characteristics. In addition, the limited number of subjects, the research design that uses one group pretest-postest design so that it does not have a control group, research instruments can be developed to explore data on the effect of active knowledge-sharing strategies if accompanied by the use of media, the duration of treatment is relatively short, long-term impact on subject learning outcomes and the influence of other variables such as individual motivation, family support and environmental conditions that have not been measured also need to be optimized in future research.

References

Amin, & Sumendap, L. Y. (2022). *164 Model Pembelajaran Kontemporer*. Bekasi: Pusat Penerbitan LPPM Universitas Islam 45 Bekasi.

https://doi.org/10.51276/edu.v6i2.1246

Badriyah, L., & Pasmawati, H. (2020). *Problematika pada Anak Berkebutuhan Khusus: Sebagai Panduan bagi Pendampingan ABK*. Jakarta: Rumah Literasi Publishing.

Dalimunthe, N., Fajri, J., & Islamiyah, U. H. (2018). Application of Active Knowledge Learning Strategy Sharing to Increase Learning Result Accounting Student Class XI IPS in High School Istiqlal Deli Tua. *International Journal of Academic Research in Business and Social Sciences*, *8*(3), 316-323.

Damayanti, A. (2022, June). Faktor-Faktor yang Mempengaruhi Hasil Belajar Peserta Didik Mata Pelajaran Ekonomi Kelas X SMA Negeri 2 Tulang Bawang Tengah. In *Prosiding Seminar Nasional Pendidikan Ekonomi, 1*(1), 99-108.

Djonomiarjo, T. (2020). Pengaruh Model Problem Based Learning terhadap Hasil Belajar. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, *5*(1), 39-46. http://dx.doi.org/10.37905/aksara.5.1.39-46.2019

Fauzy, A., & Nurfauziah, P. (2021). Kesulitan Pembelajaran Daring Matematika pada Masa Pandemi COVID-19 di SMP Muslimin Cililin. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *5*(1), 551-561.

Halawati, F. (2019). Penerapan Strategi Pembelajaran Active Knowledge Sharing terhadap Kemampuan Pemahaman Matematika. *JUMLAHKU: Jurnal Matematika Ilmiah STKIP Muhammadiyah Kuningan*, *5*(2), 64-77.

Haliza, N., Kuntarto, E., & Kusmana, A. (2020). Pemerolehan Bahasa Anak Berkebutuhan Khusus (Tunarungu) dalam Memahami Bahasa. *METABASA: Jurnal Bahasa, Sastra, dan Pengajarannya*, *2*(1), 89-97. https://doi.org/10.37058/mbsi.v2i1.1805

Hendri, A. J., Rusdi, R., Aniswita, A., & Rahmat, T. (2023). Peningkatan Minat Belajar Matematika Siswa melalui Strategi Pembelajaran Active Knowledge Sharing di Kelas VIII SMPN 03 2x11 Kayutanam Tahun Ajaran 2021/2022. *Journal on Education*, *5*(3), 7448-7456.

Irdamurni. (2019). *Pendidikan Inklusif: Solusi dalam Mendidik Anak Berkebutuhan Khusus*. Jakarta: Prenadamedia Group.

Janna, A. M., Shoffa, S., & Wahyuni, S. (2022). Pengaruh Penggunaan Metode Active Knowledge Sharing terhadap Kemampuan Komunikasi Matematika Siswa SMP. *Pedagogy: Jurnal Pendidikan Matematika*, *7*(2), 126-145.

Kushartina, S. S., & Purbaningrum, E. (2019). Pendekatan Matematika Realistik terhadap Kemampuan Operasi Hitung Pecahan Anak Tunarungu. *Jurnal Pendidikan Khusus*, *12*(3), 1-11.

Mulyono, & Wekke, I. S. (2018). *Strategi Pembelajaran di Abad Digital*. Yogyakarta: Penerbit Gawe Buku.

https://doi.org/10.51276/edu.v6i2.1246

Murtiyasa, B., & Wulandari, V. (2020). Analisis Kesalahan Siswa Materi Bilangan Pecahan Berdasarkan Teori Newman. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(3), 713-726.

Nabillah, T., & Abadi, A. P. (2019). Faktor Penyebab Rendahnya Hasil Belajar Siswa. *Seminar Nasional Matematika dan Pendidikan Matematika Sesiomadika, II*(1c), 659-663.

Nurhabibah, N., Habibi, M., Nursalim, N., & Risnawati, R. (2023). Pemanfaatan Aplikasi Let's Read dalam Meningkatkan Literasi Membaca Siswa Kelas 2 Sekolah Dasar. *Ideas: Jurnal Pendidikan, Sosial, dan Budaya*, *9*(1), 155-162.

Ramadina, A., & Rosdiana, L. (2021). Keterampilan Komunikasi Siswa Setelah Diterapkan Strategi Active Knowledge Sharing Ketika Pembelajaran Daring. *Pensa: E-Jurnal Pendidikan Sains*, *9*(2), 247-251.

Saputri, M. E. E. (2021). Analisis Miskonsepsi Siswa Kelas VI SD Negeri Gunung Pasir Jaya pada Materi Pecahan. *Jurnal Pendidikan Matematika Universitas Lampung*, *9*(2), 211-222.

Sholikhah, F. N., & Wahidah, Z. (2021). Penggunaan metode pembelajaran guru biologi di Pasuruan: Analisis persepsi siswa. *Alveoli: Jurnal Pendidikan Biologi*, *2*(1), 16-29. https://doi.org/10.35719/alveoli.v2i1.20

Silberman, M. L. (2018). *Active Learning: 101 Cara Belajar Siswa Aktif*. Bandung: Nuansa Cendekia.

Surya, E., & Fitri, R. (2016). Pengaruh Penerapan Model Active Knowledge Sharing Terhadap Hasil Belajar dan Aktivitas Belajar Siswa pada Konsep Sistem Pencernaan di Kelas VIII SMP Negeri 9 Banda Aceh. *Jurnal Serambi Ilmu*, *17*(2).

Sutiarso, S. (2019). Mengapa Sulit Menyelesaikan Soal Pecahan 2/a+ 3/b= 2/3?. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *8*(3), 420-428.

Swaratifani, Y., & Budiharti, B. (2021). Analisis Faktor Kesulitan Belajar Matematika Materi Operasi Hitung Pecahan Kelas V SD Mutiara Persada. *Lucerna: Jurnal Riset Pendidikan dan Pembelajaran*, *1*(1), 14-19.

Utami, Y. P., & Cahyono, D. A. D. (2020). Study at Home: Analisis Kesulitan Belajar Matematika pada Proses Pembelajaran Daring. *Jurnal Ilmiah Matematika Realistik*, *1*(1), 20-26.

Windi, W. A., Taufiq, M., & Muhammad, T. (2021). Implementasi Wilcoxon Signed Rank Test untuk Mengukur Efektifitas Pemberian Video Tutorial dan PPT untuk Mengukur Nilai Teori. *Produktif: Jurnal Ilmiah Pendidikan Teknologi Informasi*, *5*(1), 405-410. https://doi.org/10.35568/produktif.v5i1.1004