

Effectiveness of Story Grammar Markers in Enhancing Auditory Memory Children with Learning Disorders in Surakarta

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Abstract

Children with learning disorders often experience challenges in auditory memory processing, which affects their literacy and cognitive skills. Story Grammar Markers (SGM) have been used as an intervention tool to support narrative structure comprehension and memory retention. This study aims to evaluate the effectiveness of SGM in enhancing auditory memory in children with learning disorders in Surakarta. A quasi-experimental research design was implemented using a one-group pretest-posttest method with 15 students aged 7–8 years from various elementary schools. The intervention consisted of five sessions using SGM-based storytelling exercises. The results showed a significant increase in auditory memory scores, with an average pretest score of 16.13 and an average post-test score of 21.40 ($p < 0.001$). This study confirms that Story Grammar Markers can be an effective educational tool for improving auditory memory in children with learning disorders. These findings suggest the need for further exploration of SGM implementation in inclusive classrooms.

Keywords: Auditory Memory, Learning Disorders, Narrative Retelling, Special Education, Story Grammar Markers

1. BACKGROUND

Every child has different potential; this potential can be brought out by recognizing, developing, and creating a comfortable environment for the growth and development of children's potential. Children's potential can be developed through education. Education is a basic human need that must be met. The development of children aged 6-12 years is relatively more straightforward to educate compared to the periods before and after. One aspect of potential that develops rapidly during this period is language development (Yuni Astiti et al., 2021). Language is a system used by humans to communicate with each other. Language consists of sounds or written statements arranged systematically to produce larger units, such as morphemes, words, and sentences (Wiratno & Santosa, 2014). In addition to language, children must have cognitive development and memory skills, namely, the child's ability to understand something. Cognitive is not a component of language but is related to language. Cognitive skills in children affect language in every dimension. The mental process of learning, memory, and knowledge application is essential for acquiring and using standard language (Shiple & McAfee, 2021). Based on data from the Department of Education, the learning ability of elementary school students in Indonesia is still low compared to other countries. The average reading literacy score of Indonesia internationally in PISA 2022 fell by 18 points, falling into the low category compared to other countries. The prevalence of children with learning disabilities in Indonesia is 17.5%; children need attention and referrals related to learning disabilities (Setiawati et al., 2023). Through auditory memory processing, strategies can be used to improve student skills and success by linking language development and literacy. Auditory memory processing, or the ability to process auditory memory, is the process of processing and storing information received through hearing for reuse. This process involves a series of cognitive processes, including speech recognition, understanding the message conveyed, and remembering and repeating information heard (Magimairaj & Nagaraj, 2018). The auditory memory method can be used to improve listening comprehension and oral expression (Lafontaine et al., 2010).

Story Grammar Markers are tools with icons representing parts of the story. Children can use these icons to "mark" and analyze situations in the story in a way that is organized for themselves and

understood by others. Story grammar is an instrument developed from the MindWing Concept method (MindWing, 2024). Research has shown that story grammar markers effectively improve narrative storytelling skills (Nugrahani et al., 2020) and can improve oral narrative schemes (Yasmin et al., 2021). However, research has not been conducted to improve auditory memory skills.

This study aims to examine the effectiveness of Story Grammar Markers in improving auditory memory in children with learning disorders in Surakarta, analyze the tool's effectiveness in improving their auditory memory, and analyze how narrative structures influence cognitive recall processes.

2. RESEARCH METHOD

The type of research conducted is experimental research with a quantitative research design approach. Quantitative research is a research method that collects and analyzes data using numbers and statistics (Sugiyono, 2022). Experimental research is research designed by conducting experiments to determine the effects that arise based on the treatment (Abraham & Suprianti, 2022).

This research used a Quasi-experimental Group Pretest and Post-test design. This design tests the research subjects by providing treatment and subsequent observation. This design provides an initial test (pretest) first to test the extent of the participants' initial abilities. After the pretest is carried out, the participants will be given treatment by giving a final test (post-test) to determine the effect of their abilities after being given the final treatment (Muhandis & Riyadi, 2023).

The number of source populations is 112 students, and the sample used by the researcher is 15 students. The sample in this study was taken at Cengklik Surakarta State Elementary School, Mojosongo 1 State Elementary School, Bibis Luhur Surakarta State Elementary School, and Wonowoso Surakarta State Elementary School aged 7 to 8 years and experiencing learning disabilities. The sampling criteria used the purposive sampling technique by researchers selecting respondents based on specific criteria used in the study (Amin et al., 2023). The types of criteria are divided into two criteria: inclusion and exclusion.

Inclusion criteria include: 1) are 2nd-grade elementary school students in Surakarta, 2) students aged 7 years 0 months to 8 years 11 months, 3) students do not experience hearing impairment (auditory), 4) students experience learning disabilities. The exclusion criteria are as follows: 1) are not 2nd grade elementary school students in Surakarta, 2) students aged less than 7 years and more than 8 years 11 months. 3) students with hearing impairment (auditory), 4) do not experience learning disabilities.

The initial test (Pretest) was carried out using a numerical memory examination form. This examination has been tested for validity and reliability with valid and reliable results. Furthermore, participants will be given treatment, namely by reading stories using a story grammar marker tool for five meetings with five different stories using a storybook entitled "Selendang Bunda dan 58 Kisah Teladan" by Dewi Cendika and giving a final test (Post-test) using a numerical memory examination form to determine the effect of their abilities after being given the final treatment. In the research process, respondents underwent examinations and interventions face-to-face one by one (one by one) so that the results of the examination and intervention were accurate.

This research was conducted from June 2024 to December 2024. After the examination and intervention, the data obtained will be tested using Statistical Package for the Social Sciences (SPSS). The test is carried out by conducting a normality test; if the data is standard, it will be continued with a Paired T-test; this test is used because it is used to compare whether there is an increase in pretest results with post-test results after being given treatment.

3. RESULT AND DISCUSSION

3.1. Result

This study seeks to ascertain the effectiveness of Story Grammar Markers in improving auditory memory in children with learning disorders in Surakarta. The sample used was 15 respondents. This study design uses the One Group Pretest Post-test Design. The data collection procedure was conducted during two tests, namely before treatment (pretest) and after treatment (post-test), with five

interventions/treatments. This study involved all respondents being given a Pretest using the Number Memory Examination Form and then given an intervention using the Story Grammar Marker tool five times. This intervention was given using five stories according to the child's needs. After the intervention, a post-test was carried out to see whether there was an increase in Auditory Memory abilities after the intervention.

Table 1. Frequency Distribution of Respondents by Gender

Gender	Frequency	Percentage
Female	9	60%
Male	6	40%
Total	15	100%

(SPSS, 2024)

Based on Table 1, the frequency distribution by gender of children with learning disabilities in Surakarta shows that the number of respondents based on female gender is nine or 60% more than the number of male respondents, namely six or 40%.

Table 2. Distribution of Respondent Frequency by Age

N	Minimum	Maximum	Mean	SD
15	89.00	104.00	97.2000	3.70714

(SPSS, 2024)

Based on Table 2, Distribution of respondent frequency by age, the results obtained are that the minimum age is 89 months and the maximum age is 104 months, with an average (mean) age of 97.2 months and a standard deviation of 3.70714.

Table 3. Frequency Distribution of Auditory Memory Ability Before and After Treatment

Tindakan	N	Mean	SD	Min	Max	95% CI	
						Lower	Upper
Pre-test	15	16.13	3.60291	10	24	14.1381	18.1286
Post-Test	15	21.40	3.15776	17	26	19.6513	23.1487

(SPSS, 2024)

Based on Table 3, the frequency distribution of auditory memory ability before and after treatment is shown. The following are the details of the results. When the action was given before treatment (pretest), it obtained an average value (mean) of 16.13 with the lowest value (min) of 10 and the highest value (max) of 24. After treatment (post-test), it had an average value (mean) of 21.40, with the lowest value (min) of 17 and the highest value (max) of 26.

Table 4. Improvisation of Auditory Memory Ability Before and After Treatment

No	Participant	Pre-Test	Post-Test	Improvisasi
1.	R1	16	25	9
2.	R2	18	22	4
3.	R3	19	26	7
4.	R4	16	25	9
5.	R5	16	24	8
6.	R6	18	19	1
7.	R7	13	21	8
8.	R8	11	17	6
9.	R9	10	18	8
10.	R10	12	17	5
11.	R11	18	19	1
12.	R12	24	26	2
13.	R13	15	20	5
14.	R14	19	21	2
15.	R15	17	21	4

(SPSS, 2024)

Table 4 above shows an improvisation of auditory memory ability before and after treatment. It can be seen that the auditory memory ability of each child has improved.

Table 5. Test of Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-test	0.954	15	0.585
Post-test	0.921	15	0.197

(SPSS, 2024)

Table 5 above shows the results of the normality test. Based on the SPSS results, the p (Sig.) for the results of Auditory Memory ability before being given treatment (pretest) was 0.585. The results of Auditory Memory ability after being given treatment (post-test) were 0.197, with a $p > 0.05$. It can be concluded that the data follows a normal distribution.

Table 6. Paired T-test

Paired T-test	Signifikansi (p)		Koefisien Korelasi
	Pretest	Post-test	7.119
		0.001	

(SPSS, 2024)

The data analysis results show that the p-value (sig.) It is 0.001, so the p-value < 0.05 . So, there is a difference in auditory memory ability before and after treatment. Therefore, it can be concluded that there is an effect of using story grammar markers to improve the aural memory of children with learning disabilities in Surakarta.

3.2. Discussion

The pretest and post-test findings were assessed for normalcy. The normality test findings indicated that the data had a normal distribution; hence, proceeding with the Paired T-test was warranted. Comparison of Auditory Memory ability before and after intervention using Story Grammar Marker showed an increase. Auditory Memory ability before treatment had an average (mean) of 16.13; after treatment, it became 21.40. The lowest (min) pretest value was 10, and the highest (max) value was 24, while the lowest (min) post-test value was 17, and the highest (max) value was 26. The Paired T-Test analysis showed that Story Grammar Marker effectively improved Auditory Memory ability with a p-value (Sig.) of 0.001; therefore, the p-value < 0.05 . So, there is a difference in Auditory Memory ability before and after treatment.

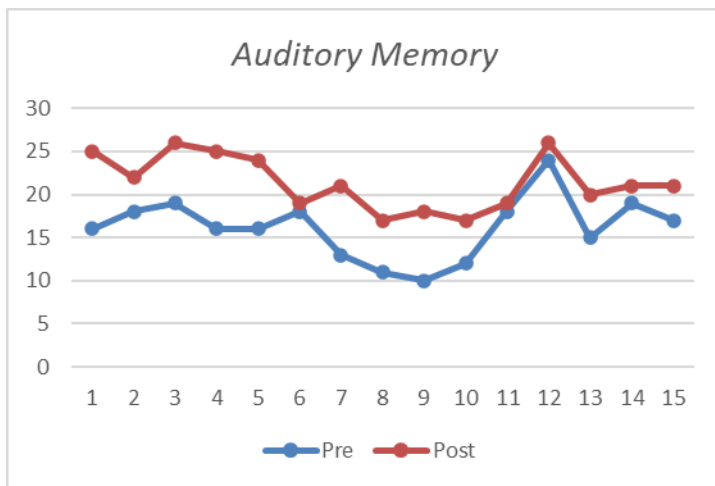


Figure 1. The Average Auditory Memory (SPSS, 2024)

Figure 1 shows that the average Auditory Memory ability before (pretest) and after (post-test) treatment was given has increased. Therefore, it can be concluded that the Story Grammar Marker tool effectively improves the auditory memory ability of children with learning disabilities in Surakarta

The results indicate acceptance of the alternative hypothesis (H_a), signifying an enhancement in Auditory Memory among children with learning impairments in Surakarta. The findings of this study correspond with the research of Miller et al. (2018) titled "Effects of a Story Grammar Intervention with Repeated Retells for English Learners with Language Impairments." This research examined the impact of narrative intervention employing Story Grammar Markers on oral narrative abilities in Spanish-speaking English learners with language impairments. The study's results indicated that the intervention employing Story Grammar Markers in conjunction with Story Retells enhanced the narrative skills of the participants due to the Story Grammar Marker intervention.

The results of this study are also in line with the research conducted by Putra et al. (2020) entitled "The Effect of Using Story Grammar Markers on Improving Reading Comprehension Skills in 8-Year-Old Children in Grade 2 of Elementary School in Mojosongo Village, Surakarta". This study aims to determine whether or not Story Grammar Marker affects improving Reading Comprehension skills in 8-year-old children in grade 2 of Elementary School in Mojosongo Village, Surakarta. The results of this study indicate the impact of using Story Grammar Marker on improving reading comprehension skills in 8-year-old children in grade 2 of Elementary School in Mojosongo Village, Surakarta.

This study's results align with the research conducted by Lafontaine et al. (2010) entitled "Effects of Story Grammar Marker: Listening Comprehension & Oral Expression." This study explains the effect of narrative intervention with a Story Grammar Marker and tests the ability of Listening Comprehension and Oral Expression. The results of this study indicate that students who receive treatment using Story Grammar Marker better understand how the story is structured and can explain the story structure easily. Listening skills are measured by answering questions about understanding and retelling the story.

The research conducted by this researcher discusses the effectiveness of the Story Grammar Marker in improving the Auditory Memory of children with learning disabilities in Surakarta. Respondents responded well to the Story Grammar Marker tool when this research was conducted. Children were seen as enthusiastic when learning to use Story Grammar Marker because the icons on the Story Grammar Marker were clear and attractive, making it easier to understand the story. Story Grammar Marker can improve Auditory Memory. The instrument used to improve Auditory Memory uses a numeric memory examination form. The numeric memory examination form has been validated and can be used for Auditory Memory (Pratomo, 2024). It has been proven that Story Grammar Marker is an activity that can improve Auditory Memory. abilities. The rationale for the impact of Story Grammar Marker is as follows.

First, interesting icons such as pom-poms help indicate characters from a story. These stars indicate settings such as time or place settings from a story. These shoe icons indicate the kick-off or the start time of a conflict in a story, and heart icons indicate the characters' feelings, such as happy, sad, angry, disappointed, and others. Hand icons that explain the plan/action that will be taken to solve problems in a story. Wooden bead icons explain how to solve problems in a story. Ribbon icons that illustrate the conclusion of a story. Moreover, glass bead icons that describe the resolution/message that can be taken from a story. The icons in the Story Grammar Marker provide children's interest and as a medium to give a better memorial function. Mahdi et al. (2009) stated that the icons in the Story Grammar Marker make it easier for children to remember parts of a story.

Second, Story Grammar Marker can increase the capacity of auditory processing. Story Grammar Marker is an activity where a child is exposed to various stories massively with various story models, providing strong auditory stimuli that can increase the capacity of children's memory. Lafontaine et al. (2010) stated that Story Grammar Marker makes it easier for children to answer questions about a story based on what they hear from the story. Third, the Story Grammar Marker can make children like stories more and not get bored with telling stories. Spencer and Petersen (2020) stated that using various modalities will improve children's thinking processes and understanding of multiple concepts. Using a few modalities will make children memorize a story, not understand it. Based on the research that has

been done, it can be concluded that using the Story Grammar Marker tool is efficacious in improving Auditory Memory in children with learning disabilities in Surakarta.

4. CONCLUSION

The researcher has constraints in collecting research data: This study only examines children's Auditory Memory. The researcher did not examine other aspects, such as the speed of answering questions and visual memory ability, so there are many interesting things to learn and study further to increase knowledge. This research design uses an experimental group pretest and posttest design so that the control group cannot be used to compare the treated and untreated groups.

Based on the research results, the results obtained the maximum value in the initial test was 24, while the maximum value in the final test was 26. This study concludes that the story grammar marker tool effectively improves auditory memory in children with special needs in surakarta, thus answering the formulation of the research problem regarding its effectiveness in this context. Therefore, sgm can be used by speech therapists to improve the auditory memory abilities of children with learning disorders.

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