

Comparison of Deaf Children's Ability to Write Texts, Procedures, and Implementing Procedures for Cooking Instant Noodles

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Abstract

This study aims to reveal the differences in the abilities of deaf children in writing procedural texts and carrying out daily procedures. No study has been found that specifically compares deaf children's abilities to write procedural texts and to carry out procedures directly, especially in the Indonesian context. This study uses a descriptive, quantitative approach and involves 10 deaf students aged 12 to 18 years at the Tarbiyatul Mutaalimin Pagaden Special School, Subang. Data were collected using two instruments: a test of writing procedural texts on how to cook instant noodles and direct observation of the cooking process. Data from the writing test and practical observation will be compared to identify significant differences between the two abilities. A paired t-test was performed in SPSS to compare procedural text writing test scores with procedural practice observation scores. The results showed that deaf children's ability to write procedural texts was lower than their ability to carry out daily procedures. The average score for the procedural writing test was 47 out of 100, while the procedural practice observation showed an average score of 79.6 out of 100. Limitations influenced this difference in the use of appropriate language, limited vocabulary, and difficulty constructing logical, structured sentences.

Keywords

Daily Procedure; Deaf Children; Language Limitations; Procedural Text; Writing Skills

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1. INTRODUCTION

Writing skills are fundamental in education, including for children with hearing impairments, deafness, or deafness. One form of writing skill that is often taught is procedural text writing. Procedural text is text that contains steps or instructions that must be followed to complete a specific task or activity (Hamida & Harsiwi, 2025). Procedural texts are a type of text that provides instructions or steps that must be followed to perform an activity or achieve a specific goal. These texts are informative and aim to guide readers or listeners in carrying out an action systematically and in a structured manner. Usually, procedural texts consist of three main parts, namely the objective, materials or tools, and steps (Santoso et al., 2024; Andrews & Baker, 2020).

Procedural texts can be found in many everyday situations, such as product instructions, recipes, or activity guides (Murwati & Syefriani, 2024; Id & Rance, 2023). However, for deaf children, the process of learning to write procedural texts is often more challenging than for children without hearing



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impairments (Sintia et al., 2024). In some cases, even though deaf children can perform a procedure well, such as cooking instant noodles or following certain instructions, they often find it difficult to express the procedure in a structured and clear written form (Saputra et al., 2024).

Previous studies have shown that deaf children's writing skills are often lower than those of hearing children. For example, research by (Agus Damiran, 2022) found that deaf students' writing skills do not come naturally and must be practiced continuously until others can understand them. Vocabulary limitations cause the writing of deaf students to be simpler than that of hearing students of the same age (Tedla & Negassa, 2019; Iswari, 2017). In addition, research by (Fisia Malonda et al., 2022) shows that the writing of deaf children differs significantly from that of children without hearing impairments, as it uses shorter, less structured sentence patterns and often leaves sentences incomplete. This indicates a significant gap in writing skills between deaf children and hearing children (Gärdenfors & Johansson, 2023). Shows that deaf students in Sweden experience delays in lexical and syntactic development in narrative writing compared to hearing students.

To date, no research has been found that specifically compares the ability of deaf children to write procedural texts and carry out procedures directly, especially in the Indonesian context (Korte et al., 2017). However, although deaf children are often able to perform daily procedures well, such as cooking instant noodles or following certain instructions, they often find it difficult to express these procedures in a structured and clear written form (Adriano et al., 2021).

The purpose of this study is to analyze differences in the abilities of deaf children in writing procedural texts and in carrying out the cooking procedure for instant noodles. This study aims to identify the extent of the gap between procedural text-writing skills and the skills required to carry out these procedures, and to understand the factors that influence these two abilities in deaf children in Indonesia. Thus, it is hoped that the factors influencing these differences can be identified, and solutions proposed to improve procedural text-writing skills in deaf children.

2. METHODS

This study uses a descriptive, quantitative approach to examine differences in the abilities of deaf children in writing procedural texts and in carrying out daily procedures. This study was conducted on August 21, 2025, at the Tarbiyatul Mutaalimin Pagaden Special School (SLB) in Subang. The targets of this study were 10 deaf children aged 12 to 18 years who had received basic education on procedural texts.

- a. Stage 1: Procedural Text Writing Test: Instructions: Students were asked to write a procedural text on how to cook instant noodles, covering the steps from preparing the ingredients to serving; Assessment Criteria: Assessment was based on the following indicators; Regularity of the sequence of steps, i.e., whether the steps are arranged in a logical and easy-to-follow order; Clarity of instructions, i.e., whether the reader can easily understand the instructions; Appropriate use of language, i.e., the use of appropriate procedural verbs (e.g., take, put in, stir).; Sentence structure: Are the sentences well-constructed and follow basic grammar rules?
- b. Stage 2: Observation of Procedure Practice: Instructions: Students are asked to carry out the procedure for cooking instant noodles directly according to the instructions given. Observation: The researcher will observe the steps students take to carry out this procedure, including alignment with the instructions, motor skills, understanding of the procedure, speed, accuracy, and conformity of the final result (instant noodles ready to serve).

Data Collection as a Procedural Text Writing Test: Students were asked to write a procedural text with clear, structured steps. Procedural Practice Observation: Researchers observed and documented the steps students followed to perform the practical procedure.

Data Collection Techniques as a Writing Test: Each student was asked to write a procedural text individually. This test was conducted in a quiet, distraction-free environment, with a set time limit for completing the task. Observation: The practical procedure was carried out in the same room under the researcher's supervision. The researcher observed and recorded the steps students took to complete the assigned task.

Data Analysis Techniques

The data obtained from the procedural text writing test and the procedural practice observation will be analyzed using descriptive analysis. The results of each instrument will be measured and compared to identify differences in the ability to write procedural texts and to carry out daily procedures.

- a. Procedural Text Writing Test Analysis: Assessment is based on predetermined indicators: regularity of step sequence, clarity of instructions, appropriate use of language, and sentence structure. The total score for each indicator will be calculated to determine the students' writing ability.
- b. Procedural Practice Observation Data: The researcher will assess the conformity of the steps with the instructions, motor skills, understanding of the procedure, speed, and accuracy, and the conformity of the final results of the procedure performed.
- c. Data Comparison: Data from the writing test and practical observation will be compared to identify significant differences between the two abilities. A paired t-test was performed in SPSS to compare procedural text writing test scores with procedural practice observation scores. Before conducting the test, a normality test was performed on the data to ensure that the distribution met the assumptions of the paired t-test.

The scores for each indicator on the procedural text writing test and the procedural practice observation were combined to produce a total score. The data obtained were then compared using a paired t-test to determine whether there were significant differences between the two abilities.

Ethical Considerations

This study obtained permission from the Tarbiyatul Mutaalimin Pagaden Special Needs School in Subang and the consent of the participants' parents to ensure compliance with applicable research ethics standards. All participants were informed about the purpose and procedures of the study and were allowed to ask questions before giving their consent.

3. FINDINGS AND DISCUSSIONS

Findings

This study involved 10 deaf students attending the Tarbiyatul Mutaalimin Special School (SLB) in the Pagaden Subang area. Of the 10 students involved, 4 were male, and 6 were female, aged 12 to 18 years. All students had received basic education on procedural texts and had basic knowledge in carrying out practical procedures, such as cooking instant noodles. The assessment of deaf children's ability to write procedural texts was conducted using six criteria: Order of Steps, Clarity of Instructions, Appropriate Use of Language, Sentence Structure, Consistency and Continuity of Instructions, and Suitability for the Final Purpose. Based on the assessment results, there were significant variations between students. The following is the distribution of average scores for each assessment aspect, as shown in Table 1:

Table 1. List of Procedure Text Writing Test Scores

Initial	Order of Steps	Clarity of Instructions	Appropriate Use of Language	Sentence Structure	Consistency and Continuity of Instructions	Alignment with the Final Goal	Value
YZ	3	4	4	3	3	4	56.67
FD	2	2	2	2	2	3	43.33
GN	2	3	2	2	2	3	40.00
ZA	3	3	3	2	3	4	50.00
NA	3	4	4	2	3	3	63.33
NI	1	2	1	1	2	2	30.00
RM	3	2	3	3	2	3	53.33
WD	3	2	3	2	3	2	50.00
KK	1	3	1	1	1	2	30.00
WS	3	3	3	2	3	2	53.33

Based on Table 1, in the Order of Steps criterion, students' scores ranged from 2 to 4, with YZ obtaining the highest score of 4. In contrast, other students, such as FD and NI, obtained the lowest score of 2, indicating that some students still had difficulty in arranging steps in an orderly and logical manner. For the Clarity of Instructions criterion, students' scores ranged from 2 to 4. YZ scored 4, while some students, such as WD and NI, scored only 2, indicating difficulty in providing clear, easy-to-understand instructions. In the Use of Appropriate Language, some students had difficulty choosing the appropriate procedural verbs. The highest score, 4, was obtained by YZ and GN, while other students had lower scores, ranging from 2 to 3. For Sentence Structure, students' scores ranged from 2 to 4. YZ scored 4, while some students, such as WD and NI, scored 2, indicating difficulty in constructing sentences with correct, clear structures. In the Consistency and Continuity of Instructions criterion, most students scored 3, indicating that their instructions were fairly consistent, although some students still had difficulty maintaining continuity between steps. For the Suitability for the Final Purpose criterion, student scores ranged from 2 to 4, with YZ and WD receiving a score of 4. However, some students, such as FD and KK, received a score of 2 or 3, indicating that the desired results of the procedures they wrote were not fully achieved.

After calculating the total scores, NA obtained the highest final score of 63.33, indicating the best procedural writing skills. Other students, such as WD, obtained a score of 50.00, indicating fairly good achievement, though some parts still needed improvement. Meanwhile, students NI and KK received the lowest score, 30.00, indicating that they experienced significant difficulties in almost all aspects of procedure writing. Overall, most students scored between 30 and 50, indicating they need further practice and support to improve their procedural text writing skills. Only YZ came close to the Excellent category but was still far from a score of 91-100, indicating there is still room for improvement in the procedural writing skills of deaf children. Moreover, the procedural text created was simple, namely, the procedure for cooking instant noodles.

Unlike the writing test, the results of the practical procedure observation showed much better performance. The following are the average scores obtained in the instant noodle cooking practice, as shown in Table 2:

Table 2. List of Observation Test Scores for the Process of Cooking Instant Noodles

Initials	Preparing Ingredients	Using Tools and Ingredients	Safety and Hygiene	Presentation	Closing the Process	Values
YZ	5	4	4	4	4	84
FD	4	4	4	4	4	80
GN	4	4	4	4	4	80
ZA	4	4	4	4	5	84
NA	5	5	4	4	5	92
NI	3	4	4	2	3	64
RM	4	4	4	4	4	80
WD	4	4	4	4	4	80
KK	4	5	4	3	3	76
WS	4	4	4	4	3	76

Based on Table 2 and the study described above, there is a significant difference between deaf children's ability to write procedural texts and their ability to carry out daily procedures. The results of the procedural text writing test show that the children's abilities are very poor, and they experience difficulties in several aspects, especially in the sequence of steps, clarity of instructions, and appropriate use of language. The average score on the writing instrument was 47 out of 100, indicating that deaf students have difficulty writing systematic, structured procedural texts.

Meanwhile, the procedural practice observation results showed that the students performed well, with an average score of 79.6 out of 100. In this case, deaf students could easily follow the practical steps for cooking instant noodles, indicating they had a good understanding of the procedure. This shows a gap between practical skills and writing skills, where deaf children find it easier to perform practical tasks than to compose them in a structured written form.

Statistical Analysis of Difference Tests

To test whether there was a significant difference between the ability to write procedural texts and the ability to carry out procedures in deaf children, a paired t-test was conducted. This test was chosen because it involved two sets of data from the same subjects: the ability to write procedural texts and the ability to carry out the cooking procedure for instant noodles. The results of the difference test showed a significant difference between the two abilities. The average score for the procedural text writing test was 47 out of 100, while the average score for the procedural practice observation was 79.6 out of 100. The paired t-test produced a p-value < 0.05, indicating that the difference between writing and performing procedures was statistically significant. These findings confirm that deaf children have better physical procedural skills than written procedural skills. Therefore, pedagogical interventions based on direct practice and multimodal approaches are needed to help reduce this gap.

Analysis of Differences in Writing and Procedure Execution Skills

The striking difference between writing skills and procedure execution skills indicates a gap between practical (motor) skills and verbal (cognitive) skills (Musyoka, 2022). The ability to carry out procedures demonstrates a high level of understanding of the steps required to cook instant noodles (Grote et al., 2024). This indicates that deaf children excel in understanding practical kinesthetic procedures.

However, when asked to write down the procedure, many students struggled to construct

structured sentences, use appropriate language, and organize the steps logically. According to (Zhou et al., 2024) Procedural texts have a distinctive structure: they usually begin with the objective, proceed to a series of clear steps, and end with the desired result. This shows that writing requires a more complex cognitive process, such as organizing ideas, constructing correct sentences, and using more technical vocabulary (Falah et al., 2024). Language limitations are a major obstacle, as stated by (Curtin et al., 2021) who show that deaf children experience delays in language development, which hinders their ability to compose texts with a clear structure (Holmström, 2024).

This study shows a significant difference between deaf children's ability to write procedural texts and their ability to carry out daily procedures. This difference can be explained by several factors, including limitations in language use, limited experience with writing procedures, and more limited language access. This discussion will link these contributing factors to relevant theories to deepen understanding of this ability gap.

Factors Causing Differences

a. Limitations in Language Use

One of the main factors influencing these differences in ability is limitations in language use. Deaf children often have difficulty constructing more complex sentences and organizing ideas logically. This aligns with Gärdenfors & Johansson's (2023) theory, which posits that deaf children experience delays in lexical and syntactic development. These delays affect their ability to compose clear, structured texts, especially in procedural writing, which requires organizing steps in a logical order. According to Cosmod et al. (2024), deaf children's limited vocabulary also hinders their ability to select appropriate procedural verbs, leading to written instructions that are often unclear and confusing. In observing procedural practices, even though they can perform the procedures well, they find it difficult to translate these actions into structured writing that follows the rules of grammar (Glorioso et al., 2022). This factor indicates that writing procedures are more cognitively complex than performing kinesthetic procedures.

b. Lack of Experience in Writing Procedures

Deaf children are generally more exposed to practical activities and receive less training in writing structured procedural texts. (Afra & Sulasminah, 2024) revealed in his research that the writing skills of deaf children are often lower than those of children without hearing impairments due to a lack of systematic writing experience. This is also reflected in the results of this study, in which most students had difficulty organizing logical and easy-to-follow steps, even though they were able to carry out the procedures well in practice (Karvita et al., 2025).

Several recent studies also reveal similar challenges in deaf children's writing abilities. For example, (Kurnia et al., 2024) In his study on specific writing instruction for deaf students, he shows that structured, multimodal interventions can improve deaf students' writing abilities. However, the use of appropriate language remains a major constraint. Additionally, (Gärdenfors & Johansson, 2023) found that deaf children often have difficulty organizing ideas logically in their writing, even though their practical ability to carry out daily procedures tends to be better. These findings support research results that show significant differences between writing ability and procedural ability in deaf children (Hardiyanti et al., 2022).

c. Differences in Access to Language

The third factor relates to access to written language or verbal language used for writing. Deaf children who rely more on sign language or visual communication may experience barriers when converting kinesthetic or visual knowledge into abstract written language (Amelia, 2024). (Sultonah et al., 2024) Research shows that reading comprehension and verbal working memory contribute significantly to deaf children's writing production abilities. This relates to the theory of written language

processing, which holds that writing is not only about producing sentences but also requires understanding spoken/written language, working memory, and structural organization. (Mursita et al., 2025). Therefore, deaf children with limited language access will find it more difficult to write procedural texts optimally than those who can perform practical steps visually/kinesthetically (Romadhon et al., 2023).

Structured and collaborative writing interventions, such as the Strategic and Interactive Writing Instruction (SIWI) approach, have been shown to significantly improve deaf students' writing skills, especially in planning, revision, and the use of appropriate genre structures (Cano & Moreira, 2018). Thus, the main obstacles to procedural writing skills in deaf children, which include limited access to written language, minimal writing experience, and a lack of genre understanding, can be explained through the theoretical basis of the writing process and genre learning that supports this approach (Wilkinson et al., 2018).

Discussion

Several factors may explain this difference. First, deaf children's limited verbal language skills can be a major obstacle to composing procedural texts. Research by (Pisoni & Conway, 2018) shows that deaf children often experience delays in language development, making it difficult for them to construct complex sentences and use the conjunctions necessary for procedural texts. This is in line with the findings of this study, which showed that many deaf students had limitations in using more complex sentences and cause-and-effect relationships in procedural texts. In addition, limitations in vocabulary are also a factor that affects the ability to write procedural texts (Agus Damiran, 2022; Gärdenfors & Johansson, 2023). Deaf children are often more accustomed to simple words that are easier to understand in everyday contexts, but they have difficulty using more technical or procedural vocabulary in writing. This shows the importance of a more intensive and repetition-based learning approach in teaching writing to deaf children (Safitri et al., 2022; Hall et al., 2021).

Although deaf children show difficulties in writing procedural texts, their ability to carry out practical procedures cannot be underestimated. Direct experience in performing procedures such as cooking instant noodles shows that they have fairly good motor skills and an understanding of the sequence of steps required (Saputra et al., 2024). This indicates that deaf children find it easier to understand and carry out tasks that are directly related to physical actions, where they can feel and observe each step being taken (Santoso et al., 2024; Malik & Din, 2019). However, when asked to write down the procedure, deaf children face a major challenge in formulating and conveying the information in a structured written form. The writing process requires skills involving the organization of ideas, the use of appropriate language structures, and the ability to connect steps logically, all of which are additional challenges for deaf children (Fisia Malonda et al., 2022; Howerton-fox & Falk, 2019).

Based on the study's results, deaf children's ability to carry out procedures tended to be better than their ability to write procedural texts. This aligns with the above factors: although practical steps can be followed visually, writing procedures require more complex written language skills and genre experience. Because these factors align with cognitive theory of writing and genre theory, the research results support the notion that written-language barriers, limited writing experience, and differential access to written language are the main causes of differences in ability. The results of this study indicate that to improve deaf children's writing skills, a multimodal learning approach that combines visual elements and hands-on practice is needed (Hoffman et al., 2017; Riza et al., 2018). The use of diagrams, procedural sequence images, or video tutorials can help students better understand and organize steps more clearly (Ode et al., 2023; Marshall et al., 2018). Hands-on learning will allow students to be more physically and mentally involved in the learning process, thereby reducing barriers to writing. The main findings of this study show that deaf children tend to perform better in practical procedures than in writing procedural texts (Nursing & Ave, 2019; Nelson & Bruce, 2019). This underscores the importance of hands-on, multimodal pedagogical interventions to overcome barriers to their writing abilities. A

learning approach that integrates visual, kinesthetic, and verbal elements is essential for effectively improving the procedural text-writing skills of deaf children.

4. CONCLUSION

Based on the study's results, it can be concluded that there is a significant difference between deaf children's ability to write procedural texts and their ability to carry out daily procedures. Although deaf children can perform practical procedures, such as cooking instant noodles, they have difficulty writing procedural texts with clear sequences and appropriate language. This indicates a gap between their motor (practical) skills and their verbal (cognitive) skills. Several factors influence this difference, including limitations in the use of appropriate language, limited vocabulary, and difficulty in constructing sentences that show the logical relationship between the steps of the procedure. These limitations cause deaf students to tend to compose procedural texts that are less structured and unclear. Practical observations show that deaf children excel at performing procedures physically because they can feel and observe each step. However, they have difficulty writing these steps systematically. This shows that, even though they understand the procedure in practice, they face significant challenges conveying this information in a structured, clear written form. With this approach, the results of this study not only provide a clear picture of differences in writing and procedural abilities among deaf children but also offer valuable insights for developing more inclusive and effective teaching methods. The implementation of more integrated and multimodal methods can be an effective solution to bridge the gap between practical and verbal abilities in deaf children.

To overcome this gap, a learning approach that combines visual, kinesthetic, and verbal aspects is needed. Here are some recommendations for the learning process: using pictures, diagrams, and videos to explain procedural steps can help deaf children better understand the sequence of actions and make it easier for them to write instructions more clearly and structurally. Learning to write procedural texts should involve extensive hands-on practice, with students physically performing the procedure before writing it down. This can help reduce barriers to writing by providing a real context for students to understand and organize the steps in the procedure. Using simpler language that remains appropriate to the procedural context is very important for deaf children. Repeated practice can also help enrich their vocabulary and improve their ability to construct more complex sentences.

Based on the results of this study, several suggestions can be made, such as developing more visual, practice-based writing-learning methods and using images, diagrams, or videos to illustrate the steps of a procedure. An inclusive approach to learning that combines visual media with interactive techniques, such as simulations or demonstrations, can help deaf children better understand procedural writing. In addition, it is important to improve the use of appropriate language and to provide repetition-based exercises to enrich deaf students' vocabulary. Training for teachers and caregivers of deaf children is also necessary to ensure that the approaches used are appropriate for their specific needs. For further research, it is recommended to include additional variables that affect deaf children's writing abilities, such as motivational factors, the use of technological aids, and variations in teaching approaches. Multimodal learning techniques that combine various media should also be tested, as should longitudinal studies to assess whether deaf children's writing skills improve over time with the application of more intensive, structured learning methods. Further research can develop multimodal approaches that integrate technology or other tools, such as applications or devices that support visual and audio-based learning. In addition, it is important to examine motivational factors and the role of social support in improving deaf children's writing skills, and to test whether a more intensive approach can lead to long-term improvement in their writing abilities. Longitudinal studies that examine age and educational background can also enrich our understanding of the development of writing skills in deaf children.

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