Interactive Writing as an Intervention to Develop English Writing Skills among Students with Hearing Impairment

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ABSTRACT

Students with hearing impairment often face significant challenges in developing English writing skills due to limited access to auditory language input and fewer opportunities for incidental language learning. This study investigated the effectiveness of the interactive writing approach as an instructional intervention to improve English writing skills among students with hearing impairment, using an ABA experimental design. The study was conducted in a special education setting and involved students with hearing impairment of primary level. The research design comprised three phases: baseline (A_1), intervention (B), and withdrawal (A_2). During the intervention phase, interactive writing sessions were systematically implemented to focus on vocabulary development, sentence construction, grammatical accuracy, punctuation, and organization of ideas. Students' writing performance was assessed repeatedly across all phases using structured writing assessment tools. Data were analyzed using statistical methods and compared to assess performance trends across the baseline, intervention, and withdrawal phases. The findings revealed a noticeable improvement in students' English writing skills during the intervention phase compared to the baseline phase, with partial maintenance of gains observed during the withdrawal phase. Improvements were evident in sentence structure, vocabulary use, grammatical accuracy, and overall coherence of written expression. The study concludes that interactive writing is an effective, evidence-based instructional strategy for enhancing English writing skills among students with hearing impairment. It is recommended that interactive writing be incorporated into English language instruction in special education classrooms to support inclusive and effective literacy development.

Keywords: interactive writing, hearing impairment, English writing skills, ABA experimental design, special education

INTRODUCTION

Developing writing skills in English poses a unique challenge for students with hearing impairments due to limited access to spoken language and incidental learning opportunities. Writing is not merely a mechanical skill; it involves integrating knowledge of vocabulary, grammar, sentence formation, and discourse organization (Graham & Perin, 2007). According to Dunn, Albagshi, and Aldawsari (2022), writing is difficult for all learners because it requires communicating ideas in sentences with correct spelling, optimal syntax, pragmatic and semantic competence, and punctuation. For students with hearing

impairments, expressing ideas in writing, which calls for integrating several competencies, is considerably more challenging. They also experience delays in language development (Schirmer, 2000). Multiple studies (Geers, 2003; Schirmer & Mcgouhg, 2005) indicate that hearing-impaired (HI) students do not write as well as their peers with normal hearing (Antia et al., 2005).

For hearing impaired students, these skills are often underdeveloped because traditional language instruction relies heavily on auditory input, which they cannot fully access. Therefore, educators have emphasized the need for alternative instructional strategies that actively involve students in meaningful writing activities. One such strategy is interactive writing, a collaborative and participatory approach that combines direct instruction with guided writing tasks. Students with hearing impairment encounter multiple barriers to writing development, primarily due to limited exposure to spoken language. According to Luckner and Handley (2008), children with HI often exhibit restricted vocabulary, incomplete knowledge of syntactic structures, and difficulties in narrative organization. These deficits arise because students with HI miss incidental learning opportunities, such as overhearing conversations, classroom discussions, or teacher explanations (Marschark & Spencer, 2010).

Several studies have shown that writing difficulties among students with HI extend beyond spelling and handwriting to higher-order skills, including sentence cohesion, paragraph development, and idea elaboration. For instance, Spencer et al. (2003) reported that students with HI produced shorter sentences, fewer complex sentences, and less cohesive texts than their hearing peers. Moreover, low confidence and anxiety about written expression further limit their engagement in writing tasks (Qi & Mitchell, 2012). These challenges underscore the importance of targeted instructional interventions that scaffold both the linguistic and cognitive components of writing.

LITERATURE REVIEW

Interactive writing is an evidence-based instructional approach rooted in Vygotsky's socio-cultural theory, emphasizing learning through social interaction and scaffolding (Vygotsky, 1978). In the interactive writing approach, the teacher and students co-construct text collaboratively, with both parties sharing responsibilities for composing, spelling, and correcting language forms. Unlike traditional writing instruction, interactive writing encourages active student participation, peer collaboration, and immediate feedback, creating a supportive learning environment for students with diverse needs.

Interactive writing also integrates multiple literacy components, including phonics, syntax, vocabulary, and punctuation. Studies have shown that this approach not only improves the mechanical aspects of writing but also enhances metalinguistic awareness, enabling students to reflect on language structure and usage (Graham, Harris, & Hebert, 2011). For students with hearing impairments, who may lack access to auditory input, the interactive writing approach provides a visual and participatory alternative that facilitates the internalization of English grammar and vocabulary through guided practice.

Several empirical studies have examined the effectiveness of interactive writing in promoting literacy skills among students with HI and other learning difficulties. Kaderavek and Justice (2002) studied preschool children, including those with language delays, and found that interactive writing sessions improved vocabulary acquisition and narrative development. Graham and Perin (2007), in a meta-analysis, reported that collaborative writing strategies, including interactive writing, significantly improved students' writing quality, sentence complexity, and idea organization. Qi and Mitchell (2012) found that students with HI who participated in collaborative writing interventions showed improved sentence structure and overall writing fluency. Richards and Malzahn (2010) reported that interactive writing not only improved writing performance but also increased students' confidence and motivation to participate in writing tasks.

These findings suggest that interactive writing is particularly effective for students with hearing impairments because it provides repeated exposure, modeling, and scaffolding that compensate for their limited auditory language input. Furthermore, the A–B–A experimental design commonly used in such research allows educators to observe changes in writing performance before, during, and after the intervention, thereby highlighting the causal impact of interactive writing on writing development.

The reviewed literature provides a strong theoretical and empirical foundation for using interactive writing to support English writing skills among students with HI. Although previous studies have established its general effectiveness, research using an A–B–A design specifically targeting secondary school students with hearing impairment remains limited. The current study addresses this gap by implementing interactive writing sessions and systematically measuring students' writing performance across baseline, intervention, and withdrawal phases. This design not only evaluates the intervention's effectiveness but also provides insight into the maintenance of writing skills after the intervention is withdrawn. Moreover, integrating interactive writing aligns with inclusive education principles, emphasizing student-centered learning, active engagement, and scaffolding, which are critical for students with HI to achieve academic success in English. By combining theoretical frameworks, empirical findings, and practical instructional strategies, this study aims to contribute to both the academic literature and educational practice in special education.

The literature indicates that students with hearing impairment face persistent challenges in developing English writing skills due to limited language exposure and cognitive-linguistic constraints. Interactive writing is a promising intervention, grounded in sociocultural theory and promoting active engagement, scaffolding, and collaborative learning. Empirical evidence shows that interactive writing improves vocabulary, sentence structure, and text coherence while increasing students' confidence and motivation. The current study builds on this evidence, employing an A–B–A experimental design to systematically investigate the impact of interactive writing on secondary-level students with hearing impairment, thereby addressing a critical gap in the literature.

Research Objectives

The objectives of the study were to:

1. Assess the baseline English writing skills of hearing-impaired students before implementing the interactive writing approach as an intervention.

2. Evaluate the effectiveness of interactive writing in improving English writing skills among hearing-impaired students.

3. Compare students' writing performance across the baseline (A_1), intervention (B), and withdrawal (A_2) phases using visual analysis of performance trends.

Research Hypotheses

H_1:   The Interactive writing approach as an intervention has a significant impact on improving the English writing skills of students with hearing impairment compared to their baseline performance.

H0: The interactive writing approach as an intervention has no significant impact on improving the English writing skills of students with hearing impairment compared to their baseline performance.

METHODOLOGY

The study used an A–B–A experimental design to examine the effectiveness of the interactive writing approach as an intervention to improve English writing skills among students with hearing impairments. The design included three phases:

- **Baseline Phase (A_1):** Writing skills were assessed without intervention to establish a stable performance trend.

- **Intervention Phase (B):** Interactive writing sessions were implemented systematically.

- **Withdrawal Phase (A_2):** The intervention was withdrawn to determine whether the improvements were maintained when the strategy was no longer applied.

This design allowed for repeated measurement and visual analysis of individual performance across phases.

The study population comprised hearing-impaired students in grade 4. The sample for this study comprised 13 hearing-impaired female students with profound hearing loss, selected from Hamza Foundation Academy for the Deaf, Lahore, with prior permission from the institute's principal. Simple random sampling was used to select the sample for this study.

Instrument

A self-developed questionnaire, adapted from a fourth-grade English textbook, was used to assess the English writing skills of students with hearing impairments. This instrument (questionnaire) comprised four questions. The first question was objective, in which students were asked to encircle the word with correct spelling; the second question was also objective, in which students were asked to make sentences using the given words; the third question comprised reading comprehension, and the last question was based on narrative writing (self-writing) on a given topic. This questionnaire was also validated by three subject-matter experts, and the test's reliability was assessed at $\alpha = .718$ using SPSS. This questionnaire was applied as a pre-test to establish a baseline for the English writing skills of hearing-impaired students.

Administration of Pre-test

After confirming the instrument's validity and reliability, a pretest was administered to the entire group of grade-4 hearing-impaired students to establish a baseline for English writing skills in English. One of the researchers provided the students with written instructions for administering the writing test.

Intervention

The intervention was delivered by researchers using the interactive writing approach to enhance English writing skills among students with hearing impairments. The interactive writing approach is a collaborative literacy strategy in which a teacher and students create a meaningful text together, with students taking an active role in the physical process of writing. Interactive writing helps students improve their writing skills by providing a teacher-like example and fostering the right mindset for students to correctly replicate the paragraph-writing techniques demonstrated by the teacher (Wirhayati, 2020). During the intervention, threats to internal and external validity were controlled. The intervention was delivered to the students over a four-week period. A total of four chapters (My House, Summer Trip, The Fox and the Grapes, and A Thirsty Crow) were taught to students with hearing impairments using an interactive writing approach. The

researchers used audiovisual aids, 2D charts, and other materials to teach the students. In this process, teachers and students jointly compose texts, making the writing process observable and clear, thereby improving students' confidence and skills in areas such as phonics, grammar, and structure. The intervention focused on the same content as the pre-test. Student performance during the intervention was documented by the researchers. Following completion of the intervention, the researchers observed changes in the English writing skills of students with hearing impairments. The treatment was provided by the researchers for a month. A total of 72 hours was allotted for teaching English writing skills through interactive writing instruction to hearing-impaired students. The treatment was scheduled on the first five days of each week.

Post-test Administered

After the intervention was completed, the researchers administered a self-developed questionnaire as a post-test to assess the level of English writing skills among hearing-impaired students and to evaluate the intervention's effect. The same test was used in the post-test as in the pre-test to reveal the difference.

DATA ANALYSIS

The data were analyzed using SPSS software. The results were presented in tabular form, and the tables are presented below. Independent and paired-samples t-tests were used to assess the results, particularly the significant mean difference between the pre-test and post-test.

Table 1:Frequency Distributions on Demographics of Hearing Impaired Students

Variables	Frequency
Total No. of Students	13
Gender	Female
Age	11-12
Type of Disability	Hearing Impairment
Degree of H.L	Profound
Name of Institute	Hamza Foundation Academy for the Deaf

Table 2: Paired Sample T-test for Comparison amongEnglish Writing Skills Based on Pre-test and Post-test Results

Variables	Mean	N	SD	r	t	df	Sig. (2-tailed)
Pre-test scores	10.92	13	1.656	.270***	-6.38	12	.000
Post-test scores	18.38	13	4.350				

***p> .05

Table 2 presents the total scores for the pre-test (M=10.92, SD=1.656) and post-test (*M*=18.38, *SD*=4.350). It is also indicated (*r = .270, t = -6.38, df = 12, Sig. = .000). Thus, there is a significant difference between the mean pre-test and post-test scores of 4th-grade hearing-impaired students.*

Table 3:Paired Sample t-test of Question No. 1 Based on Pre-test and Post-test

Variables	Mean	N	SD	r	t	df	Sig. (2-tailed)
Pre-test Q. 1	3.62	13	.870				

Post-test Q.1	4.69	13	.751	.314***	-4.070	12	.002

*** *p> .05*

Table 3 shows that pre-test question No. 1 (M=3.62, SD=.870) and post-test question No. 1 (M=4.69, SD=.751). The results also indicate a significant difference in the mean score for question No. 1 between the pre-test and post-test (r = .314, t = -4.070, df = 12, Sig. = .002).

Table 4: Paired Sample t-test of Question No. 2 Based on Pre-test and Post-test

Variables	Mean	N	SD	R	t	df	Sig. (2-tailed)
Pre-test Q. 2	3.38	13	1.446	.468***	-2.843	12	.015
Post-test Q. 2	4.54	13	1.391				

****p>.05*

Table 4 illustrates that pre-test question No. 2 (*M*=3.38, *SD*=1.446) and post-test question No. 2 (*M*=4.54, *SD*=1.391). It is also indicated (*r*=.468, *t*=-2.843, *df*=12, S*ig.*= .015). This indicates a significant difference between the mean scores for question No. 2 on the pre-test and the post-test.

Table 5: Paired Sample t-test of Question No. 3 Based on Pre-test and Post-test

Variables	Mean	N	SD	r	t	df	Sig. (2-tailed)
Pre-test item 3	3.77	13	.832	.278***	-4.503	12	.001
Post-test item 3	4.85	13	.555				

****p> .05*

Table 5 indicates that pre-test question No. 3 (M=3.77, SD=.832) and post-test question No. 3 (M=4.85, SD=.555). It also shows a correlation (r=.278, t=-4.503, df=12, Sig.= .001). Therefore, there is a significant difference between the mean scores of question No. 3 based on pre-test and post-test results.

Table 6: Paired Sample t-test of Question No. 4 Based on Pre-test and Post-test

Variables	Mean	N	SD	r	t	df	Sig. (2-tailed)
Pre-test item 4	2.15	13	.555	.070***	-4.999	12	.000
Post-test item 4	4.31	13	2.983				

****p> .05*

Table 6 shows pre-test question No. 4 (M = .15, SD = .555) and post-test question No. 4 (M = 4.31, SD = 2.983). It also indicates an r = 0.70, t = -4.999, df = 12, Sig. = .002, showing a significant difference between the mean scores of question No. 4 based on pre-test and post-test results.

FINDINGS

1. It was found that the scores of pre-test results of hearing impaired students of grade 4th exhibited lower (*M*=10.92, S*D*=1.656).

2. The post-test scores of hearing-impaired students in the 4th grade were higher (M=18.38, SD=4.350).

3. There is a significant difference between the mean scores of pre- and post-test results (r = .270, t = -6.38, df = 12, Sig. = .000).

4. There is a significant difference among the results of all questions based on pre-test and post-test results.

5. Interactive writing skills as an intervention have a positive impact on improving the English writing skills of hearing-impaired students.

CONCLUSION

The study concludes that an interactive writing instruction approach improves English writing skills among hearing-impaired students. Instructor involvement with learners through this approach yields strong results and a significant difference between pre-test and post-test scores. This shows that the interactive writing instruction approach is a viable strategy for developing writing skills among hearing-impaired students and can support them in various ways in the future. The results emphasize the importance of interactive writing instruction, and teachers are advised to continue this practice in public and private sectors on a daily basis. Because the interactive writing instruction approach is a collaborative learning technique based on cooperation between the teacher and the student, it has been proven to be more effective. Therefore, the English writing skills of hearing-impaired students can be enhanced by using this technique.

DISCUSSION

The study's findings reveal that interactive writing instruction is an effective approach for developing writing skills among students with hearing impairments. The primary objective of this study was to assess the impact of interactive writing instruction on the improvement of English writing skills among hearing-impaired students. It has been determined that this approach can positively impact the learning of students with hearing impairments when used in regular classrooms. According to Dostal, Wolbers, and Holcomb (2024), Interactive Writing Instruction (IWI) is a research-based paradigm that can be used across any writing level and genre for deaf children. For example, learners should set a goal of presenting their ideas authentically, adhering to the genre's rules, and using appropriate syntax and spelling. In this study, it was found that the majority of children experienced a positive effect of this approach on their learning, as their performance improved as a result of the intervention. According to Dunn, Albagshi, and Aldawsari (2022), writing is difficult for all ordinary learners since it requires them to communicate their ideas in sentences with proper word spelling, optimal syntax, pragmatic and semantic competence, and punctuation.

RECOMMENDATION

1. The technique is applied in 4th grade; it should also be implemented in Montessori and early grades.

2. The Interactive Writing Instruction (IWI) approach should be used regularly in both the public and private sectors to meet the unique educational needs of hearing-impaired students.

3. Teachers should be provided special training to use such strategies in the classroom.

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