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ARTICLE

Investigation of the Development Process of Expository Text Structure for University Students with Hearing Impairments

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ABSTRACT

This study aims to explore the teaching process of expository text structures to hearing-impaired university students enrolled in vocational education programs. This action research study involves eight second-year Computer Operator Program students with hearing impairments at a special education institution, along with the researchers. The applications followed the principles and elements of Balanced Literacy Instructional Approach (BLIA). Inductive analysis was employed to analyze the research data, which included lesson videotape recordings, validity committee audio recordings and meeting minutes, lesson plans, the researcher's diary, student products and documents, and pre- and post-test results. The research revealed that students exhibited limited development in reading comprehension of expository texts in relation to their language levels. Nevertheless, the practices are believed to have positively influenced the students' understanding of the strategies they should use, their comprehension of text structures, and their ability to think critically while engaging with the texts. The finding that students require additional time and repetition to enhance their abilities aligns with the existing literature. The students' language skills indicate that they were unable to benefit from effective education during the educational processes they underwent, despite the current legal regulations' sufficiency. To ensure that students improve their literacy, it is recommended to establish strategies for the effective implementation of teaching and practices at all educational levels, starting from pre-school education.

Keywords: Expository Text Structure; Literacy Development Strategies; Individuals With Hearing Impairments; Teacher Research

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1. Introduction

Hearing-impaired students encounter challenges in developing language skills and their literacy skills develop at a slower pace than those of their hearing peers. It has been determined by various studies that the majority of individuals with hearing loss in Türkiye have primary/secondary school level language skills when they reach secondary/higher education levels[1–4]. Hearing-impaired individuals' daily, academic, and professional lives are adversely affected by this situation. To promote the successful literacy of hearing and hearing-impaired individuals, it is necessary to employ a variety of educational strategies, activities, and approaches.

Teaching text structure knowledge is a strategy that involves integrating various methods and activities to enhance reading and writing development [5]. Text structure refers to the way information is organized in a text [6]. Throughout their educational lives, every individual encounter expository texts intensively. Expository texts employ a variety of text structures. In the same text, one text structure can transition into another, or a text structure can be embedded within a different text structure. All these factors contribute to the complexity of the texts. Additionally, expository texts can provide students with concepts in which they have not previously encountered. To comprehend the message conveyed, readers must infer a meaning from the text, use their prior knowledge, and do reasoning [7].

There are various classifications of expository text types in the literature, with the most reliable being: (a) definition/explanation/description, (b) comparison and contrast, (c) compilation, (d) cause-effect relationship, and (e) problem and solution. Research indicates that knowledge of text structure contributes to the development of comprehension of expository texts[8], establishing a mental framework that effects the reader's comprehension[9]. It is stated that teaching the basic structures of expository texts can assist students in focusing on critical concepts and relationships, estimating the type of information that will follow these words, and assessing their comprehension as they read[7].

1.1. Instructional Approach and Teaching of Expository Text Structures

The literature highlights overlapping processes and strategies in teaching expository text structures. Reciprocal Teaching Model is emphasized as a key approach by Palincsar et al. [10], and Palincsar and Brown [11], to enhance text structure knowledge and comprehension skills for expository texts. It is seen that related studies share the following characteristics: the teachers functioning also as a role model, the students' active participation in the process, and the utilization of questioning, clarifying, predicting, and summarizing strategies used by effective literates. The teacher's objective is to establish a framework that models and guides students in applying these strategies, allowing students to independently employ the strategies and to enhance their capacity to monitor their reading comprehension. Tompkins[12], on the other hand recommends implementing expository text structures by engaging students with the text, introducing sign words, using graphic organizers, and that teachers write a single shared writing text on the board as a model for their students regarding the text structure type. Tompkins also emphasizes the significance of continuous assessment throughout the educational process and composing texts in groups or individually after students have acquired specific skills. Expository text structures can be taught through the following strategies: introducing text structures, predicting/using prior knowledge, asking questions, clarifying, summarizing, teaching sign words, using graphic organizers, thinking aloud/modelling, summarizing, and writing[5, 6, 8].

The approach used in the teaching process is important. The research was conducted using Balanced Literacy Instructional Approach (BLIA). Consistent with the principles and components of BLIA, a variety of strategies and activities were implemented. Various studies have demonstrated that BLIA enhances the literacy abilities of both hearing and hearing-impaired individuals [4,13–15]. BLIA is an approach that gives equal importance to all language skills, requires intensive reading and writing activities daily, supports student development by offering necessary assistance based on their needs, and applies the lessons in a metacognitive way. The implementation process is as critical as the product in BLIA; educational environments are structured to emulate the development of effective literacy behaviors in new learners or struggling readers and strategies are taught both directly and indirectly. BLIA's reading comprehension and writing components include (i)

Shared Reading/Writing, (ii) Interactive Reading/Writing, (iii) Guided Reading/Writing, (iv) Independent Reading/Writing [2, 13, 16].

In *Shared Reading/Writing*, the instructor is responsible for the reading and writing activities. The instructor guides the lesson by asking questions, doing oral and written corrections if needed, determines the sentence to be written as a group getting the final result of a composed single text. In *Interactive Reading/Writing,* both the teacher and the students are actively involved in the reading and writing processes. However, the sentence to be formed is determined collectively, and a singular text is composed in collaboration. The teacher in *Guided Reading/Writing* supervises the students as they read or write texts and provides oral and written corrections as needed. Each student writes a text. All these stages from Shared Reading/Writing to Independent Reading/Writing are a process that is designed to cultivate independent literacy of the student [13, 16, 17].

1.2. Individuals with Hearing Impairment and Expository Texts

Hearing-impaired students struggle to develop reading comprehension strategies independently as they don't develop their reading comprehension skills at appropriate age levels. It has been noted that these students are unable to generalize skills related to understanding, analyzing, and evaluating the emotions and thoughts conveyed in texts, and they struggle to apply these skills in new content and contexts[18].

Similar to their hearing peers, it is crucial for hearing-impaired students to receive instruction in strategies that enhance their reading comprehension and writing skills. The combined use of various strategies in their education, along with increased opportunities for practice and repetition, is necessary[14, 19–23]. When strategies are not taught to hearing-impaired students with the aim of developing their language skills, they are often found to acquire very few of these strategies independently[20, 24]. Therefore, it is emphasized that there should be an intensive focus on strategy-based training to enhance the reading comprehension and writing skills of hearing-impaired individuals[19, 24]. Kelly[25] states that, based on the data from her research, direct instructions should be intensely involved in educational programs for individuals with hearing impairments.

Upon reviewing the relevant literature in the country where the research was conducted, it is evident that the educational services provided to hearing-impaired students are not being implemented effectively and that the students are not receiving educational and support services tailored to their needs and levels [3,26–28]. Most international studies conducted with hearing-impaired students focus on narratives, examining the impact of story structure knowledge on reading comprehension and analyzing teaching processes. However, research on expository texts is relatively scarce [2, 7, 9, 29–31] Expository texts are frequently used in vocational education, which relies heavily on specialized terminology. Research is needed for both hearing and hearing-impaired students on the instructional processes of expository text structures and the strategies employed during the reading of such texts [29]. This study aims to investigate the instructional process of expository text structure to hearing-impaired university students pursuing vocational education. The study, therefore, seeks to address the following questions:

1. How has the text reading comprehension instruction process been conducted?
2. Which activities and strategies have been utilized?
3. How have the applications influenced students' reading comprehension skills concerning expository texts?

2. Methods

This study was designed using the qualitative research method of action research. Considering the participants and their responsibilities within the educational setting, the research is classified as action research, as being conducted by the instructor investigating a problem within their own classroom [32]. Instructor-led action research is a qualitative research method which systematically and reflectively examines the impact of instruction in a classroom or the entire school on the students' learning process [33, 34]. Although the problems, reflections, and solutions that teacher researchers identify are unique to their own respective classrooms, they enable teachers to link specific issues to broader theoretical frameworks. Teacher research, therefore, serves as a conduit between theory and practice, filling in the gap [35, 36]. This research meets the educational objectives of the higher education institution in which the

research was carried out while also holding a significant value as teacher-led research.

In action research, the processes of identifying the problem, developing research questions, conducting a literature review, creating action plans, collecting and analyzing data, implementing action plans, and sharing results with the research team exhibit a continuous and interrelated cyclical feature [35, 37]. An example of the dialectical cycle of action research is presented in **Figure 1** [38]. In this study, the education process of strategies applied to hearing-impaired youth to acquire information about informative text structure was examined and action plans were developed. The Ethics Committee Report dated December 27, 2022, and numbered 456081, was obtained from Anadolu University's Social and Human Sciences Scientific Research and Publication Ethics Committee.

Figure 1. Action research cycle (KNILT, 2024).

2.1. Setting

The school, in which the research was conducted, was established in Turkey in the 1993–1994 academic year, and educates hearing-impaired students in Graphic Arts, Ceramics, Computer Operator Training, and Architectural Drafting Associate Degree programs, alongside both elective and compulsory language courses. These courses aim to empower hearing-impaired students to utilize their language skills autonomously, enhance their literacy abilities, and articulate professional terms and subjects in both written and oral communication.

The research data were collected in the language classroom of "214", equipped with necessary instruments for hearing-impaired students [39], including a smart board with internet access and a library featuring dictionaries and grammar guides. Insulation materials on the walls facilitated the display of diagrams and posters. In lessons, students were arranged in a U-shape in front of the smart board, allowing them to see both the teacher and their peers while following along.

2.2. Participants

2.2.1. Students

The research was conducted with students from the Computer Operator Associate Degree Program, which trains individuals in new technologies, software and applications for roles that involve using computers. The study included eight second-year students enrolled during the spring term of the 2023–2024 academic year, selected through a convenience sampling procedure.

All students have sensorineural hearing loss in both ears. Except for S5, all are congenitally hearing-impaired. S5 became hearing-impaired at the age of 2.5. While the Total Communication Method is used in group interactions, various effective communications method is employed in individual interactions based on students' conditions. Before the research, students were informed about the purpose and process, and their written consent was obtained. During the process of informing and obtaining written permissions, translation was done through a sign language interpreter, and the permission letter was reflected on the smart board and explained. The written permission document stated that participation in the research was voluntary and that they could withdraw from the research at any time. Throughout the research process, students' feelings, opinions and needs were treated sensitively. Participants' names were kept confidential by anonymising their names into codes. **Table 1** provides information regarding the students' educational backgrounds and hearing impairments.

Table 1. The educational backgrounds and hearing impairments of the students.

	Age Gender	Degree of Hearing Loss (Better Hearing Ear)	The Age of Hearing Loss Onset	Age of Onset of Hearing Aid	Preschool	Elementary School	Secondary School	Socio Cultural Status**
S1	25/M	113 dBHL	Congenital	2	-	SfHI		D
S2	20/F	81 dBHL	Congenital	3	Inclusive Education			C2
S3	20/F	83 dBHL	Congenital	3			Boarding Vocational High School for Hearing-Impaired Students	C2
S4	25/F	108 dBHL	Congenital	10	-	Inclusive Education & SfH		E
S5	24/F	106 dBHL	2.5	11	-			C2
S6	24/M	102 dBHL	Congenital	2	-			C1
S7	21/M	60 dBHL	Congenital	2	SfH*	SfH		C1
S8	21/F	104 dBHL	Congenital	2	-			C2

* SfH: School for Handicapped;

** [40].

Language Proficiency of Students

Students were divided into two categories based on their syntactic skills. The first group includes S7, who has a moderate hearing impairment and can speak clearly, while S2 and S3, identical twins, are severely hearing impaired. Although S2 and S3 do not struggle with personal and tense suffixes, S7 occasionally misuses them. Once pointed out, they are able to correct their errors. The students occasionally made mistakes when responding to the query words "which", "why", and "how", but were able to self-correct. All three students began using devices approximately at the age of two and completed kindergarten education. They also experienced difficulties with reading comprehension and writing.

The other five students (S1, 4, 5, 6, 8) are severely hearing impaired. They communicate through writing and sign language, although their limited writing proficiency sometimes hinders effective communication. They frequently make errors with personal suffixes, pronouns, adjectives, and tenses, and they have limitations in reading comprehension. Based on the Turkish course outcomes of the Ministry of National Education [41], their skills are equivalent to those of 3rd and 4th graders [1]. All students except S5 are congenitally severely hearing-impaired. S5 became hearing impaired at age 2.5, in the critical period for language acquisition, and was fitted with a device at the age of 11. S1 and S5 encountered the most challenges during the research, with S1 being unable to benefit from hearing devices, although being fitted with a hearing device in both ears. On the other hand, it was identified that S5 had discontinued the use of hearing aids before starting their secondary education. S4, 6, and 8 successfully used simple past tense suffixes in most cases, but occasionally misused present continuous, reported past, and future tenses, correcting their mistakes when pointed out. All three students stated that they were given devices around the age of two, but that they stopped using them during their secondary education. S6 is noted as the most academically successful in the class, likely due to his intellectual level and socio-economic background. All students attended boarding vocational high schools for the hearing impaired, received no family education, and utilized behind-the-ear devices.

2.2.2. Research Team

The research team consists of the project coordinator, the article's author, and two validity committee members. The author, who completed her bachelor's, master's, and doctorate degrees in Special Education with a focus on the Education of Individuals with Hearing Impairments and possesses basic sign language proficiency, conducted the initial planning, literature reviews, text preparation with AI, data acquisition, and research reporting. Various precautions were taken by the researcher during the data collection process since they were both a teacher and a researcher. One of these was; while determining the problems related to the purpose of the research during the lessons, the students were continuously evaluated with observations and end-of-lesson quizzes while managing

the class. These evaluations ensured that the needs of the students were understood with data and actions were taken based on the data. The researcher did not perceive situations such as students' low motivation personally and focused on the reason for this. They received feedback by watching the lesson plans and evaluations, student notebooks, lesson video recordings with the validity committee members. Reflective evaluations and videos were examined repeatedly to distinguish whether they reflected events or ideas.

All team members are lecturers with a minimum of 29 years' experience in hearing impairment education. They have participated in qualitative research projects focusing on vocational training, employment, and language skills development for individuals with hearing loss, contributing to their expertise through implementation, data collection, and validation studies. Their findings have been presented at national and international conferences and published in indexed journals.

2.3. Research Process

The research was conducted in two phases: planning and implementation. The planning phase began in the autumn term of the 2023–2024 academic year, during which literature reviews were conducted, and expository texts and lesson plans for assessment and evaluation were prepared. During this time, the author also instructed students in the "Written and Oral Expression III" course, assessing their language proficiency through observations, interactions, and written work. The literature review and the researchers' knowledge informed the planning of activities and strategies for the implementation phase. The expository text analysis process included silent and aloud reading, narration, shared reading, exercises with unknown words, sign word exercises, answering written questions, utilizing graphic organizers, and writing summaries (Monitoring Meetings Held on January 9 and March 19, 2024).

Implementation occurred during the spring term of the 2023–2024 school year, from March 12 to May 23, 2024. Data were collected in the 'Computer Operator Written and Oral Expression Practices IV' course (3 hours on Tuesdays) and the "Computer Operator Individual Language Support Course IV" (2 hours on Thursdays). Since the first hour of the Written and Oral Expression courses focuses on Career Planning support, research data were collected in the final two hours. Data were gathered from both classes for a total of four hours per week, with validity committee meetings held on Wednesdays (**Figure 2**).

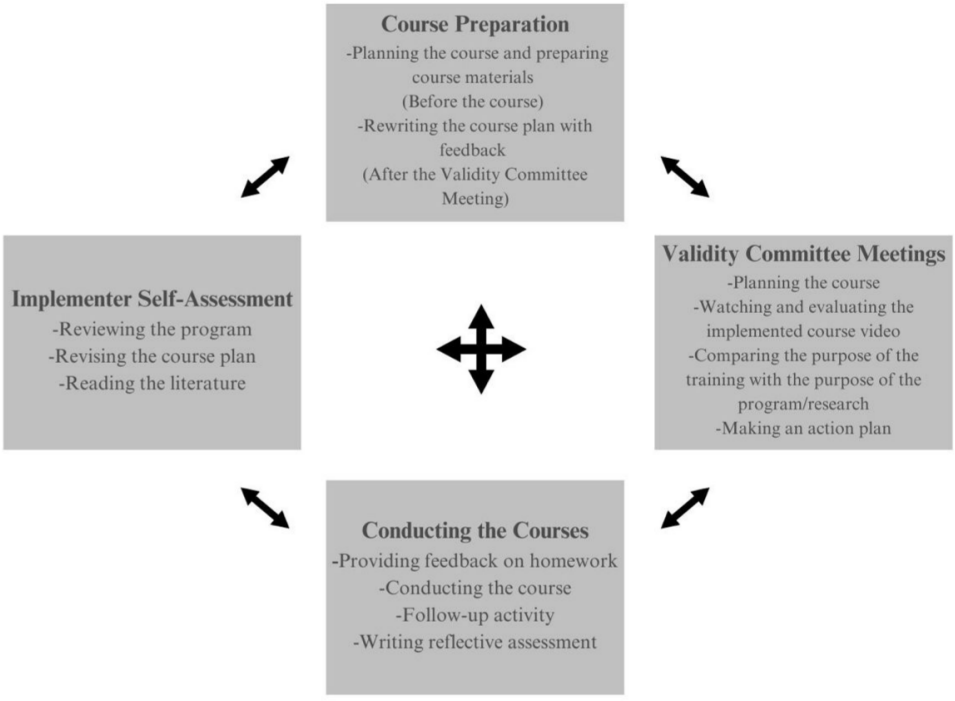

Figure 2. Implementation process' weekly action cycle.

Utilized Expository Texts and Their Features

In the research process, four texts were employed to assess students' reading comprehension of expository texts, while another four were used in the application process. All texts exhibit characteristics of a description/explanation text structure and include compilation, comparison, cause/effect, and problem-solving elements.

Compilation, comparison, and cause/effect texts were sourced from the Informal Reading Comprehension Inventory developed by Karasu et al. [42]. Three texts from the Science section were used during implementation, while three from the Social Sciences section were used for measurement and evaluation. The texts correspond to the third, fourth, and fifth grades of primary education. The problem-solving texts were prepared on the topic of Computer Operator. The text "Programming Analysis" was authored by a computer field expert involved in the validity committee, while the text "My Computer Does Not Work" was generated by the ChatGPT 3.5 model for measurement and evaluation. **Table 2** presents the texts, their structures, and implementation dates.

All of the researchers have taught language, professional language and field courses to students for at least one semester. The students' knowledge and experience about their language levels have been the most important factors in determining the level and content of the texts. Due to the limited language levels of the students, texts from primary education level and the fields in which they receive social sciences and vocational education were studied. Another factor in determining the texts is related to the purpose of the research. Primary education level texts were used because of the variety of informative text structures and the fact that more than one informative text structure can be given one after the other or embedded in each other in an informative text, making it difficult to understand.

Table 2. Characteristics and Application Dates of Informative Texts Used for Measurement and Evaluation Purposes.

Expository Text Structure Type	Implementation Dates	Pre-Test Dates	Post-Test Dates
Description/Explanation Compilation	12, 14, 19, and 21 March 2024	27 February, 5 and 7 March 2024	28–30 May 2024
Description/Explanation Comparison	26, 28 March and, 02, 04 April 2024		
Description/Explanation Cause/Effect	16, 18 April and 07, 08,14 May 2024		
Description/Explanation Problem/Solving	21, 22 and 23 May 2024		

2.4. Data Collection Techniques and Analysis Methods

Qualitative and quantitative data collection methods were employed throughout this research [35,43]. Qualitative data included lesson plans and evaluations (18 items), lesson video recordings (36 hours, six minutes, recorded with a Classroom 4-Camera System), researcher diaries (19 pages, typed in 12-point font with 1.15 line spacing), validity committee minutes (8 items), audio recordings (5 minutes, 7 seconds), student information forms, student products (notebooks and portfolios), and documents (8 audiograms and educational records) [34]. Quantitative data were collected to assess students' reading comprehension of expository texts, with identical questions administered in both pre-test and post-test formats. The results were analyzed using the Dependent Samples (Paired) t-test. One text was generated by ChatGPT 3.5, while the remaining three were sourced from the Informal Reading Comprehension Inventory [42]. This inventory assesses reading comprehension levels through reading aloud/error analysis, retelling, question-and-answer, and gap-filling techniques. The study focused on students' ability to retell texts and respond to queries.

Validity studies were conducted for the other two texts, "Programming Analysis" and "My Computer Does Not Work", and their questions, except for the six texts taken from the Informal Reading Comprehension Inventory [42]. The appropriateness of the content of the text "My Computer Does Not Work", which was written to ChatGPT 3.5 and used for evaluation purposes, was examined by the validity committee member who is an expert in the field of computers. The paragraph about the "BIOS settings" of computers in the content was evaluated as "too much technical information" and was removed from the

final text. The text called 'Programming Analysis' used in the application process was also written by the same validity committee member. The appropriateness of both texts to the problem-solution type informative text structure, sentence structure, types of questions to be answered after reading and expert opinions on the scoring of the answers were made by two other faculty members responsible for language courses. Questions were prepared based on the Question-Answer Relationship (QAR) Strategy outlined in the reading comprehension inventory [44]. For "My Computer Doesn't Work", used in both pre-test and post-test, only question-answering was evaluated, and a reliability study ensured measurement accuracy. Inter-rater reliability was calculated using the formula "Consensus/(Consensus + Disagreement) × 100", achieving 100% consensus for both tests [45]. Qualitative data collection and analysis were conducted simultaneously. Data were gathered in a continuous, cyclical, and reflective manner, consistent with the study's objectives and validity committee decisions. Inductive analysis was applied, with lesson plans and video recordings reviewed to determine activity processes [43]. Transcriptions and verification studies were carried out by the validity committee. Findings will first be presented in relation to each other and then discussed within the context of existing literature.

2.5. Trustworthiness

Trustworthiness criteria in qualitative research correspond to the validity and reliability concepts in quantitative research, including credibility, transferability, dependability, and confirmability [46]. Various qualitative and quantitative data collection techniques were employed to ensure trustworthiness. Result consistency was examined, and participant validation was conducted. Detailed descriptions of participants, processes, and environments were provided to ensure transferability. All research stages were documented through video and audio recordings to ensure verifiability and reliability. The alignment of lessons with the BLIA was assessed using an evaluation form, while validity committee minutes and researcher diaries were maintained. Consistency across data sources was also examined. Validity committee members, as field experts, contributed to text preparation, question development and scoring, application evaluation, and data verification during the research process. A literature review was conducted concurrently with data collection.

3. Findings

The findings obtained in the research were conveyed within the text reading comprehension education process. In order to contribute to teacher practices, the strategies used in answering questions about the activities carried out in the education process were presented by enriching them with examples. The activities in the research process were carried out as; Introduction to text analysis, Modeled Reading, information on sign words, preparing graphic organizers, answering written questions and summarizing (**Figure 3**). In this study; the findings and results obtained in the activities of introduction to text analysis course, modeled reading and answering written questions are conveyed.

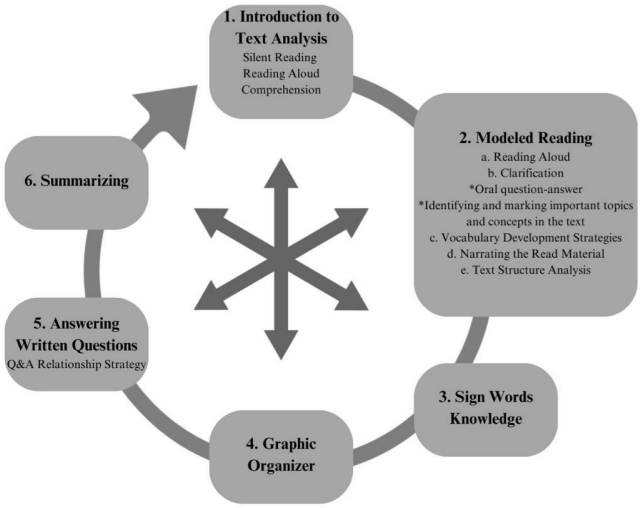

Figure 3. The implementation process.

Activity Implementation Process

During the research process, communication was established with hearing-impaired students through the total communication method. In the lessons, all texts were reflected via smart boards, the components of language, reading, writing, speaking, listening, sign language and all accessible visuals (photographs, tables and graphics) were used simultaneously. The teacher wrote the words/expressions that they thought their students encountered for the first time, words' synonyms that they believed to be better known, on the board, read the words, and had the students read and write the words in their notebooks.

In the first lesson, which was also an introduction to the research, information about text types, parts of the text, and text structure was repeated. In order to relate new information to previous ones, information about the text structure and parts of the text of informative texts was given in this lesson by associating them with the information about the story text structure and parts that the students had previously learned. This study was carried out in the first lesson hour of the lesson on March 12, 2024, and posters showing text types and structures were prepared to be hung on the classroom wall during the lesson. In the introduction sections of the following lessons on March 14 and 19, 2024, this information was repeated (Lesson Plans dated March 12, 14, and 19, 2024), and the names of the informative text types were added to the syllabus during the process. The researcher stated the students' need for repetition in the lesson evaluation dated March 14, 2024, as, 'I know, the information I give feels like it is hanging in the air, they need a lot of repetition.' Due to the intense need for repetition, the validity committee on March 19, 2024, decided to repeat the information on text type and structure in the training process, unlike the planned syllabus, and repetitions were planned to be made in the lectures on April 2 and 16, and May 7, 2024. The findings of the research regarding activities and strategies are given below.

3.1. Silent Reading, Reading Aloud and Retelling

The teacher used various metacognitive strategies before the first silent reading of the text. These strategies were aimed at predicting the content of the text from the title, monitoring the student's own reading comprehension process, and determining the purpose of reading. For this purpose, before moving on to the silent reading phase of the texts, the teacher asked the students to predict the content of the text based on the title. In order to make the students think about what they know about the text, the questions '*What might be explained in the text? What did you learn about this subject before*?' were asked. The students made predictions about the content of all the texts except for the text titled "Beings in Our Environment" and shared their previous knowledge. All of the students stated that they did not know the meaning of the word 'being', while S1, 4, 5, 7, and 8 stated that they did not know the meaning of the word 'environment'. Since the first two sentences of this text defined both words, the teacher asked them to read the text silently and make predictions about the meanings of the words by saying '*Let's start reading our text. Try to guess the meaning of these words. Their definitions are in the first sentence. What could their meaning be?*' This behavior of the teacher is aimed at supporting the student's efforts to deduce the meanings of words they do not know from the text. The definitions of words they do not know were later provided during the modeled reading.

During the silent reading process, the teacher provided information about what to do and how to read the text by saying, 'We will read an informative text with you, read the text very carefully. Pay attention to what information is in the text. Then I will ask you to explain it without looking at the text. Finally, we will read the text together.' (Video No. 1 12/03/2024). With this guideline, the students were asked to read the text carefully and were informed about what would be asked of them after reading the text. Another issue emphasised at this stage was questions and guidance aimed at determining the purpose of reading. The questions 'Why are we reading the text?' were answered as 'To learn informative text structures.', 'To learn information.'. During the research process, repetitions were included regarding the purpose of reading the text and, it was aimed for the students to develop the behaviour of determining their reading purposes.

After the students read the text silently for the first time, the questions and expressions 'Did you understand the text? Would you like to read it again? If you do not understand, you need to read it again and again. Ask yourself questions about the parts you did not understand.' were used to emphasize that the text should be read more than once to understand it, and the students were asked to read the text again. At the beginning of the study, it was determined that none of the students made markings that would support understanding, such as identifying words whose meanings they did not know, important information in the text, or definitions during silent reading. This strategy, called clarification, was used to help students monitor their own understanding. During Modeled Reading, students were given a model, and it was decided to include clarification-oriented goals in all lesson plans (4th Monitoring Meeting, 26/03/2024).

While the students were narrating the text, they were not allowed to get any clues from the text, they were asked to narrate without looking at the text, and if they needed, they were asked questions for support and given reminders. It was determined that students with better language skills conveyed more information from the text and all students except S6 showed the behaviour of memorizing the text. S 1, 4, 5 and 8 stated that they could not explain the rest after telling the first sentence or paragraph of the text, that they had difficulty, and wanted to look at the text repeatedly (Videos dated 14/03/2024, 28/03/2024, 18/08/2028 and 23/05/2024). It is thought that this is a behavior that comes from primary and secondary education processes, and that they can cope by trying to memorize the text with the activity of telling what they read due to their limited language development (Researcher's Diary, p. 8). S7 explained their strategy for understanding long texts as 'I did not understand Programming Analysis when I first read it. It was long. I read it again, I take short things from the text and understand it.' Considering that they were one of the students with the best language and communication skills in the class, it was determined that they used a strategy that would not contribute to the development of a young person receiving vocational training and that it was not effective.

3.2. Modeled Reading

In the study, all reading comprehension studies conducted as a group language course were carried out with Modeled Reading due to its suitability for the students' language levels. This process was carried out after retelling. Before the teacher started reading the text aloud, they asked the students to read the text silently again and to identify the words they did not know the meaning of or the expressions they could not understand by underlining them, and listed these words on the board while examining the text together. After the text was read by the students; the teacher read the text word by word on the smart board with a pencil. The teacher underlined the words whose meanings were unknown or the expressions that could not be understood, and the explanations were made verbally and in writing. During this process, the teacher both modeled the text by asking questions aimed at understanding the text and guided the lesson. After examining each paragraph, a student was asked to summarize the part read in two or three sentences. If necessary, verbal and written corrections/explanations were made in the answers given by the students. The teacher used the students' misunderstandings as a teaching opportunity and provided instant feedback for their mistakes.

After the reading of the text was completed, this part of the text review section was completed with the questions 'We have reviewed our text, is there anything you did not understand?' and 'Do you have any questions?'. Modeled Reading, which provides the necessary support to readers who have problems with reading comprehension, also provides opportunities for the development of vocabulary and reading comprehension skills. At the stage where the text was understood and no questions were asked from the students about the text, text structure analyses were conducted by repetitions and comparisons on the text being read using the sections of the writing on the classroom wall and informative text structure types posters. During this process, the introduction, development and conclusion sections were marked on the text projected on the smart board; the information and characteristics of the text, informative text type were shared verbally and in writing.

The opportunities that emerged during the examination of the texts to guess the meaning of the word were evaluated by the teacher and became a model for guessing the meaning. For example, in the first text examined, the text "Cleaning", the meaning of the word 'cold (flu)' was stated as an unknown word by S8. The strategy was explained to the student by marking the text with a pen and using sign language as follows (Video No. 2, March 14, 2024).

> *'First, let's read this sentence containing the word. "For example, when we have a cold, we should blow our noses with a tissue, then throw the tissue in the trash." Okay, I read it, I didn't understand it. Now let's read the sentence in front of it. "We should also pay attention to cleanliness when we are sick." Let's read the rest. "For example, when we have a cold, we should blow our noses with a tissue, then throw the tissue in the trash." You read it again. What could it mean? There's a clue.'*

The student reread the sentences as the teacher modelled, guessed the meaning of the word correctly and smiled as they stated that they understood it, using sign language. The correct guess of S8 was shared with the class and its use in all other reading comprehension studies was emphasized. During the research process, while the meanings of some words were guessed, some could not be guessed and this was especially emphasized to the students. For example, the meanings of the words 'frequently' (sık sık in Turkish)', which is a reduplication, and 'therefore' (böylece in Turkish), which can be an adjective or adverb depending on the context and has the feature of being a signal word, could not be guessed. It was emphasized that there would be difficulties in guessing the words and that we might not be able to guess the meaning of every word.

In the Modeled Reading process, the words that the students stated that they did not know the meaning of were listed on the board. For effective vocabulary development, the definitions of the words were determined according to the students' levels; if there was a student in the class who knew the meaning of the word, this student was asked to convey the definition; in some cases, the words were given from the dictionary or written directly by the teacher; or, depending on the students' knowledge of the word, they were written with Interactive Writing, in which both the teacher and the student took an active role. If there was a visual of the word, the visual was shared with the smart board over the internet. Then, sample sentence/s were created for each word, the word and sample sentences were read aloud and written by the students in their notebooks. According to the inventory from which the texts were taken, the number of words whose meanings were not known in the texts at the third, fourth and fifth grade reading level of primary school [42] was determined to be the highest number of six in the text called "Nutrition" (energy, breathing, balanced, protein, mineral and carbohydrate) (Video No. 2, April 16, 2024). It was stated that students did not know the meanings of words such as 'type, definition, inference, net, experience, visual' which are frequently used in daily life and in the education process, as well as the words in the texts. These findings describe the level of limitation of students' vocabulary.

3.3. Answering Written Questions

The questions to be answered after reading were prepared according to the Question-Answer Relationship (QAR) strategy. QAR is a strategy aimed at developing reading comprehension in which different question types are introduced (textual explicit, textual implicit and scriptual implicit) and how to answer them is taught [47, 48]. In the pre-test and application process; the strategy used by the students in the textual explicit question type, where the answer is clearly stated in the text, which is the easiest question to answer - except for S6 - was determined as; 'even if they do not understand the question', they find the word/expression in the question and match it in the text and write the sentence as it is. (Researcher's Diary p. 6; Video No. 2 03/14/2024). S6 had more independent literacy characteristics than the other students. For this type of question, students were asked to write only the information requested by the question as an answer consistently throughout the process. In the post-test, it was determined that students responded to such questions only by using the information requested in the question, and this effect was reflected in the post-test scores.

The stages of answering the questions were carried out by students answering individually, checking the correctness or incorrectness of the answers by the teacher, and answering them with a group lesson. While answering the questions, explanations were made on the text for each question regarding the type of question and how the questions were answered. Throughout the process, the teacher and students were intensely modeled for each other. Question types were expressed in the explanations as 'questions whose answers are clear in the text and easy to answer' (textual explicit), 'questions whose answers are in the text but are not clearly stated, which allow us to read the text again and again to find them and understand the text better, inference questions' (textual implicit) and 'questions where we use our past knowledge and experiences while answering' (scriptual implicit). The question type they had the most difficulty with was questions requiring inference. A limited number of texts were examined during the research process. It was determined that students needed more repetition in order to learn how to answer such questions due to their language limitations (Researcher's Diary, ps. 7, 12

and 16; Course Evaluations Dated 19/03/202, 02/05/2024 and 22/05/2024).

3.4. Quantitative Data Findings

In the study, pre-test and post-test data were collected in order to determine the effect of the practices on the development of students' reading and understanding of informative texts. Responses were evaluated out of 100 points. A Dependent Samples T-Test analysis was conducted to determine whether there was a statistically significant difference between the pre-test and post-tests. Potential hypotheses were determined as 'H_0: There is no difference between pre-test and post-test scores. H_1: There is a difference between pre-test and post-test scores.' Data analysis was conducted using SPSS Statistics 24.0. Pre-test and post-test results for answering questions and explaining what was read are presented in **Tables 3** and **4**, and findings are presented in **Tables 5** and **6**.

Table 3. Answering pre- and post-test results.

Participants	Pre-Test	Post-Test	Difference (Post-Pre)
S1	36	62	26
S2	40	67	27
S3	53	66	13
S4	40	67	27
S5	15	67	52
S6	47	96	49
S7	61	79	18
S8	44	73	29

Table 4. Retelling pre- and post-test results.

Participants	Pre-Test	Post-Test	Difference (Post-Pre)
S1	29	31	2
S2	17	36	19
S3	29	41	12
S4	28	65	37
S5	20	28	8
S6	54	60	6
S7	49	40	−9
S8	30	45	15

As a result of the Dependent Samples T-test for students' answers to questions about informative texts, post-test scores increased by 30.125 points compared to the pre-test. $t(7) = -6.88$, $p < 0.001$ shows that this increase is statistically significant. The effect size/Cohen's d = 2.08 shows that there is a high increase and that the activities and strategies implemented contribute to the development.

It was determined that the students' post-test scores regarding reading and explaining informative texts were also higher than the pre-test scores. When the average difference was examined, the post-test scores increased by 11.25 points compared to the pre-test. $t(7) = 2.25$, $p = 0.059$. Since this difference was statistically very close to the $p = 0.05$ threshold, borderline significance was determined. The effect size/Cohen's d = 0.79 shows a moderate increase. These results show that the applications are potentially effective. However, it can be said that the results were affected due to the decrease in S7's score (−9) and the number of participants being 8.

Table 5. Findings regarding question answering levels.

	n	$\bar{x}$	Ss	Sh	T Test	
					sd	t
Pre-Test	8	42,00	14,92	30,125	7	5,89
Post-Test	8	72,13	11,58			

* $p < 0.001$.

Table 6. Findings regarding retelling levels.

	n	$\bar{x}$	Ss	Sh	T Test	
					sd	t
Pre-Test	8	32,00	13,14	11,25	7	2,25
Post-Test	8	43,25	13,97			

* $p < 0.0001$.

4. Discussions and Conclusions

In the study, the teaching of informative texts and text structures was carried out with the BLIA approach. In the analysis process of each informative text; educational environments were provided where silent reading, reading aloud, telling what was read in sign language or verbally, Modeled Reading, Modeled and Interactive Writing studies were carried out. When deciding on the reading and writing components used, the students' language levels and the areas they needed to develop were decisive. This situation coincides with the result expressed in the research results carried out by Karasu et al. [2] and Uzuner et al. [4] in the institution where the research was conducted; the processes carried out according to the lesson plans, materials prepared after the student language levels were determined and the observation, reflection and monitoring meetings carried out support the development of the students. Determining the students' language skill levels before the application process and the continuous evaluations in the process were the most important factors in planning the teaching process. The effectiveness of the applications has been determined many times in various studies [2, 4, 13, 16, 31, 49, 50]. The originality of this research stems from the search for an answer to how to teach informative text structures to hearing-impaired students with the specified language and communication skill levels. However, it is important that the language components of BLIA were applied in line with the principles of the approach. During the research process, the principles of the approach; conducting lessons in a metacognitive manner, creating application environments where all components of the language are given equal importance, providing frequent reading and writing opportunities, modeling inadequate readers for the development of competent literacy behaviors, and teaching how to use strategies both directly and indirectly were applied.

Various applications were made in order to carry out the teaching in a metacognitive manner. By using pre-reading strategies, students were asked to think about what they know about the subject of the text, the purpose of reading was determined with the knowledge that the applications were made to understand informative texts better, they were asked to determine whether they understood and whether they needed to read again, they were asked to monitor their own understanding (self-monitoring), to ask themselves questions to understand while reading and to verbally summarize what they understood from the paragraphs. Thus, as Baker and Brown [51] stated, it was aimed for students to be aware of their own thoughts and to control them. A systematic and effective teaching environment was created in order for students to notice how they read, to control it and to develop self-correction behaviors when necessary. Again, in this process and the monitoring of the applications with a checklist was a factor that increased validity.

During the research process, students stated that the texts examined in the lessons were informative texts and had a different structure than the story. In the lesson dated 21.05.2021; S7, while explaining the text named "Program Analysis", spontaneously said, '*This is not a story. It is different. It provides information. This is an informative text. It is about programming analysis. We are doing a lesson on this.'*, and S5, when asked to explain what they read, said, 'I did not understand, I will read it again. Wait a minute.'. This result is consistent with the statements in the studies of Schirmer [14] and Paul [20] that students with hearing loss develop their language skills with the use of systematic and effective education methods appropriate to their level.

In the study, various activities and strategies were used intensively in order to develop the skills of understanding informative texts. In this process, it was thought that it would not be realistic to expect students to both understand the text and to follow and acquire the strategies used. For this reason, various and long-term studies were carried out on the same text. While the process of working with a text at the beginning of the research process was four to five weeks, the implementation of all activities related to the text named Program Analysis, which was considered the most difficult text by the students, was completed in three weeks. The text contents were selected from general/current and professional topics that can be encountered in daily life. The content and language levels of these texts will inevitably be challenging for hearing-impaired individuals. In the study, it is thought that introducing the strategies to the students and providing models about when and how to use them is effective in teaching informative texts. In addition, it is thought that the inten-

sive practices made by the students indirectly affect the development process of their reading and writing skills [5]. The development seen, albeit limited, is consistent with the Reciprocal Teaching model and Oczkus's [52] emphasis on the importance of using predicting, questioning, clarifying, and summarizing strategies.

The modeling strategy, along with the question-answer strategy, was the most commonly used in the study [53]. The teacher became a model in the teaching and/or use of all strategies. The reason for this is that almost all of the students did not have knowledge and experience with literacy strategies. It is thought that the applications in the research process changed the students' perspectives on the use of strategies and contributed to their development. This finding is consistent with the data of the study conducted by Irwin, Buelh and Radcliffe [54]. The researchers emphasized the importance of individuals knowing how to use the relevant strategies and skills in order to become effective readers and writers. They also suggested the modeling strategy as one of the important strategies that should be implemented at all levels of education because it benefits metacognitive development.

The most important problem experienced with question answering was determined as students not being aware of different question types. It is thought that students are asked text-explicit questions in primary and secondary education to a large extent. It can be said that these types of questions are preferred by teachers because they can be prepared in a short time and relatively easily. In order to answer text implicit questions, it is necessary to determine the meanings that are not directly found in the text but are derived from the understanding and combination of different sentences. It is stated that in the studies conducted in our country on inference questions, this type of questioning is either not given any or very little place [55, 56]. Answering these questions requires advanced language skills, cognitive capacity and intensive practice. In these conditions, it is inevitable that hearing-impaired students will have difficulty answering such questions or will not be able to answer them at all. Hearing students can develop this ability on their own with the language skills they have, but hearing-impaired students should be taught such skills [30]. The third type of questions, which require using past knowledge and experiences to be answered, greatly help students improve their reading comprehension in the shortest time and in the most effective way [20, 48]. It is stated that hearing-impaired students cannot answer such questions unless they are taught how to answer Questions Based on Past Knowledge and Experience, such as inference questions [57]. Cooter and Flynt [58] draw attention to the importance of texts being appropriate to student levels and text structures being well-organized in question-answering studies. However, even under these conditions, the fact that students have problems answering all three types of questions supports the concern about the quality of education of students with hearing loss in primary and secondary education processes. Selvi's [3] research results that the majority of hearing-impaired vocational high school students do not understand what they read at all and do not have written expressions also reinforce the concern.

The students' vocabulary limitations caused problems in determining important information in the text and making various predictions. The students' lack of knowledge of the meanings of the question words and their limitations in understanding what was asked in the question were an unforeseen problem in the research process and also an important reference for the students' language levels. In order to develop the students' vocabulary; giving the definition directly or creating a definition together, expanding the definition made by the student, giving the synonym of the word, guessing the meaning of the word from the context were used as strategies. It is thought that these applications aimed at vocabulary development indirectly affect the reading comprehension of the students [20]. This result of the research is consistent with the results of the research conducted by Karasu, et al. [2] in which they aimed to develop vocabulary in teaching professional terms to hearing-impaired students. The researchers determined that the students showed significant progress in learning the meanings of professional terms. However, they stated that these applications should be carried out in all educational processes with early diagnosis and intervention, by including systematic and intensive repetitions. In order for the concepts to be acquired, they need to be sufficiently understood. Teaching vocabulary development strategies and their use by students should be carried out in all levels of education - spread over time - and with intensive repetition [2, 31, 59]. When the vocabulary of the students is examined, it is seen

that they are far behind their hearing peers. It is thought that this is due to the fact that the students have not accessed effective reading and writing education during their education life.

The use of the guessing strategy was realized as guessing the content of the text from the title and guessing the meaning of the word using clues in the text. In the text reading review studies carried out with Modeled Reading, opportunities arose for the students to infer the meaning of words they did not know from the text and these opportunities were evaluated. The teacher modeled the students' strategies of guessing the meaning of words from the text and using clues. However, the lack of sufficient information in the context and/or the limitations in the students' languages made it difficult to make guesses. However, it was determined that the students could guess the meaning of words from the text. This result is consistent with the results of Ahn's [60] research on whether hearing-impaired children can learn the meaning of words from the texts they read. As a result of the research, it is stated that students with hearing loss can learn the meaning of words from the context while reading, but certain arrangements should be made in the texts. It is important to teach this strategy in trainings carried out with hearing-impaired individuals and to guide them to use this strategy in different environments [35, 61].

Writing was used in answering questions, defining, writing sample sentences, and summarizing. All written expressions were carried out through interactive writing, where the teacher and student worked together to create a single text; due to the students' language levels, the research could not proceed to the stage of writing their own informative texts. The researcher used many strategies such as question-answer, finding the main idea, preparing a graphic organizer, and summarizing to support the students' development [7]. Although very limited, writing activities are thought to have a positive effect on students' writing skills and attitudes towards writing [62].

When the quantitative data of the research were examined, it was determined that the students performed less in retelling than in answering questions. One reason for this situation is that retelling is a more difficult skill compared to answering questions. Another reason can be explained as the fact that the questions were prepared in the text-explicit question type, which is a relatively easy question type to answer, depending on the students' language levels. During the applications, how to answer these questions was taught and this was reflected in the students' performances. This finding is consistent with the finding in Icden's [30] study, which supports that students with hearing loss easily learn to answer such questions. When the students' performances in answering the questions were examined, it was determined that they showed improvement not only in the text-explicit question type, but also in answering textual implicit and scriptual implicit questions. Despite the students' language level limitations, it can be said that the applications positively affected the development of their skills in answering such questions based on their age and experience [63]. According to the analysis results of the findings regarding retelling, the p value was very close to the 0.05 threshold, and student developments were evaluated as "borderline significant". The skills aimed to be acquired are skills that aim to improve reading comprehension. Considering the language levels of the students participating in the study, the limited significance detected is valuable.

When the factors that determine the language levels of students are examined, it can be said that the reading comprehension skills of hearing-impaired students are limited compared to their peers due to their lack of effective practices [3, 26–28]. When the test results of the students were evaluated individually, it was determined that they did not develop in proportion to their language levels. This finding of the study does not match the finding stated by Marschark et al. [59] that students with hearing loss who have good language skills benefit more from the trainings. It can be said that this situation is due to the language skill levels of the students participating in the study and the fact that the practices were carried out during a teaching period. This finding is consistent with Schirmer's [14] statement that the training processes of hearing-impaired students should be spread over a long period of time and include intensive repetitions in order for them to learn.

In order to integrate the applications carried out during the research process into the curriculum in educational environments, it is important that the courses in the curriculum support each other and benefit from the interdisciplinary approach, which can be expressed as 'integration

of literacy development with other developmental areas', which is one of the components of BLIA. The interdisciplinary approach is defined by Jacobs [64] as the conscious implementation of an education and training program by bringing together more than one discipline in order to examine a specific content, subject, problem or experience. Today's education programs should support the development of students who can learn general and specialized information on their own and who can act independently. In the educational levels and environments where education takes place, arrangements that will provide cooperation and effective communication between educators that will ensure interdisciplinary studies can be suggested.

5. Recommendations

The order of the activities and strategy applications in the study were determined in line with the language levels and needs of hearing-impaired students. Students had problems in applying the strategies and showed limited development in the process. However, it is thought that the strategies applied by the teacher in line with the BLIA principles and the students' authentic participation contributed to the students' understanding of informative text structures and their internalization of the strategies. Implementing the strategies starting from pre-school education and teaching hearing-impaired students how to use them themselves are of great importance in terms of the development of language skills. It was concluded that the hearing-impaired students who participated in the study moved to the next grade without acquiring the academic and language skills at the expected grade level during their education processes. This situation directly reflects on their academic and professional lives and reduces their quality of life in the long term.

It is thought that the study, which is a teacher research, will guide future applications regarding the teaching of informative text structures. For further research; development of digital-based materials for hearing-impaired students, testing the long-term effect of the BLIA model with the participation of more students with different language and communication skills, and conducting comparative studies between disabled and non-disabled students can be recommended.

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Institutional Review Board Statement

I declare that this study, uploaded to Forum for Linguistic Studies, is original and adheres to scientific ethics in all stages, including preparation, data collection, analysis, and presentation. All data and information not obtained within the scope of this study are properly cited in the bibliography. The data used has not been altered, and I have complied with the ethical duties and responsibilities by accepting all the terms and conditions of the Anadolu Universtiy Committee on Publication Ethics.

Informed Consent Statement

Informed consent was obtained from all participants involved in the study.

Data Availability Statement

Information about data and materials used in the study is available.

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Conflict of Interest

The author confirm that there are no financial, commercial, legal, or professional conflicts of interest related to the publication of this article.

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