ARPHA Proceedings

Proceedings ICTE-2025: Uzbekistan, 0815-0825
doi:10.3897/ap.11.e0815

International Conference on Teacher Education (ICTE-2025: Uzbekistan)

Technology of Research-Oriented Learning of Coherent Speech in the Conditions of Bilingualism

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Abstract

The paper presents the research-oriented technology designed to develop bilingual students' competencies in producing original texts in a second language. Conventional pedagogical approaches fail to adequately address the need to develop skills in creating coherent texts in a second language. In our opinion, this skill requires a clear understanding of the mechanisms involved in constructing coherent speech across different languages, the ability to positively transfer overlapping communication patterns (transposition), and the capacity to mitigate interference caused by divergent linguistic structures in both written and oral forms. The authors hypothesized that this will improve the quality of university students' coherent speech in both languages. This *research aimed to* develop the content of the research-oriented technology for bilingual university students. The technology can be used to teach students coherent speech considering the linguistic phenomena of both positive (transposition) and negative (interference) influence of the native language on the second language. *Research objectives* were: 1) to develop an algorithm for students' research activities; 2) to determine the content of the technology; 3) to test tasks aimed at successfully overcoming errors typical for bilinguals. Coherent speech is conceptualized in this study and encompasses the mechanisms of inter-phrasal coherence, consistent utilization of structural and semantic units, and linguistic devices for stylistic cohesion. The empirical results indicate that the number of university students successfully generating original texts in the second language increased by approximately 50%. This enabled us to conclude that this pedagogical framework not only encourages independent inquiry but also imparts the skills necessary to perform transposition, overcome interference, and compare linguistic features. It develops the students' ability to analyse and construct coherent texts in both native and second languages, thereby advancing their overall linguistic proficiency.

Keywords: bilingualism, bilingual student, coherent speech, technology, education, research, text.

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Published by Samarkand State University and peer-reviewed under responsibility of ICTE-2025: Uzbekistan (International Conference on Teacher Education)

Introduction

The phenomenon of coherent speech in bilingualism remains an area of ongoing research, with a significant gap between linguistic theory and pedagogical practice. Linguistic studies have extensively explored coherent speech from the perspective of text theory (Creswell & Plano, 2017), while the methodology of teaching a native or second language focuses on teaching monologue and dialogue (Anderson et al., 2018).

Teachers often understand coherent speech as a text but tend to use this term formally, equating any statement with a text. Currently, text linguistics and text analysis procedures are of particular interest for programmers. However, even texts generated by artificial intelligence are not flawless in terms of linguistic norms.

In university education, students often do not fully grasp the existence of special textual units and the norms and mechanisms for their construction. These textual units, laws, and mechanisms are consistent across all languages. Therefore, a comprehensive understanding of textual units is essential for mastering coherent speech in two (or more) languages. It is well-established that understanding structural features of textual units in one's native language facilitates understanding similar features in a second language. Consequently, educators should incorporate techniques of transposition (positive transfer) of structural similarities of textual units between languages.

Traditional approaches to teaching coherent speech in a bilingual context have proven to be insufficiently effective. Students can easily master the structural features of textual units in different languages but struggle to apply these features when retelling or constructing narratives. To address this issue, we propose that students should be introduced to research methodologies, when knowing the structural features of text units (paragraphs revealing one thought, or microtexts revealing one microtheme) transforms into a tool (or means) for independent research activities. This research-oriented approach equips students (future educators) with the skills which are necessary for integrating independent research into their teaching practice.

The contradictions between linguistic theory, language teaching methodology, and educational practice have prompted the problem focus of this article on developing a technology for research-oriented learning of coherent speech in a bilingual context.

Purpose and objectives of the study

This *research aims to* develop the content of the research-oriented technology for bilingual university students. It can be used to teach students coherent speech by taking into account the linguistic phenomena of both positive (transposition) and negative (interference) influence of the native language on the second language.

Research objectives: 1) to develop an algorithm for students' research activities; 2) to define the content of the technology; 3) to test tasks designed to help students successfully overcome errors typical for bilinguals.

Literature review

The focus on the use of new methods, technologies, and technologies of language learning is present in the program documents of many countries (Jang & Brutt-Griffler, 2019; National Center for Education Statistics, 2016; National Clearinghouse for English Language Acquisition, 2018; New York State Education Department, 2018). Many materials suggest new strategies for language education (Baker & Wright, 2017; Calderón et al., 2018). Some of the documents are related to analysis of the problems of language education and promotion of new initiatives (Chang et al., 2015; Galloway et al., 2017).

Of particular interest are the works related to the analysis of interaction of English with the native languages of immigrants, national minorities (Brutt-Griffler, 2017; Gándara & Escamilla, 2016); the place of the state language in multilingual education (Dołowy-Rybińska, 2018; Forrest, 2017; Stell & Dragojevic, 2017).

The problems of using new methods and technologies of language teaching are also considered in many works (Creswell & Plano, 2017; Jang & Brutt-Griffler, 2019; Roiha & Mäntylä, 2022).

Psychological issues of motivation, methodological support, and stimulation of independent research activity are raised in the studies of different countries (Aizawa & Rose, 2019; Ardasheva et al., 2018; Bradford, 2018).

The problems of language teaching effectiveness in the context of implementing various programs and learning strategies are frequently discussed (Anderson et al., 2018; Chao et al., 2019).

However, there are relatively few studies focused on teaching coherent speech in a creative environment and on exploring different models of bilingualism and multilingualism (Cantero et al., 2016; Mohanty, 2019; Welter et al., 2016).

In Russia, the national project “Education” implemented a series of initiatives from 2019 to 2024 aimed at creating opportunities for self-realization and talent development (Passport of the National Project, 2018). However, these initiatives pay limited attention to the issues of bilingualism and multilingualism among the peoples of the Russian Federation.

For example, at Kazan Federal University (Russia, Tatarstan), more than 40,000 students are enrolled, including over 10,000 ethnic Tatars and about 10,000 foreign students. This means that nearly half of the student body faces challenges related to bilingualism and multilingualism. The difficulties these students experience in achieving self-realization through scientific activity are evident.

Students struggle significantly with writing and presenting scientific work, such as articles, projects, and theses. Their communicative competencies – including the ability to speak and write coherently – in academic and scientific language remain at a low level.

Methodology

The pedagogical experiment was conducted in 2019-2024 in Kazan Federal University (Kazan, Russia) and Moscow Institute of Physics and Technology (Moscow, Russia) where bilingual students study, those who mostly speak their native languages and have Russian as a second or foreign language.

The study involved 12 experimental groups of university students, totaling 2,423 participants. The gathered data were compared with the results obtained in 12 control groups, with a total of 2,425 students, where these tasks were not implemented.

As in the previous pedagogical experiment (Gabdulkhakov et al., 2022), we aimed to shift from traditional teaching methods to a technological-research approach.

This new framework encourages university students to actively participate and perform as researchers of textual structure, especially in coherent speech. Students focus on coherent speech, exploring the mechanisms behind constructing coherent texts in both first and second languages.

Our hypothesis suggests that by examining and comparing these mechanisms in different languages, bilinguals can independently transfer similar communication patterns and reduce interference caused by

divergent structures. This process is designed to improve the quality of their coherent speech in both languages.

The content of the research-oriented learning technology is based on the three methods of writing a coherent text outlined in the first part of our research (Gabdulkhakov et al., 2022).

The first method is the mechanism of inter-phrasal connection (IPC) that suggests using lexical repetition in different sentences of the text. Repeating nouns links different sentences and makes the text coherent. For example: *В городе есть* ***университет***. *В* ***университете*** *мы учимся. (There is a* ***university*** *in the city. We study at the* ***university****.)* Repetition can be implemented in the form of a chain link. A pronominal replacement of a noun may also be used. For example: *В городе есть* ***университет***. *В* ***нём*** *мы учимся. (There is a* ***university*** *in the city. We study at* ***it (there)****.)*

This chain connection works similarly in different languages and therefore can be used for transposition from one language into another.

In the experimental tasks students were suggested to find the IPC (lexical repetition) in texts in their native and second languages, and then to use this repetition to make their own statements in two languages.

The challenge of this research task lies in the fact that Turkic languages like Tatar, Turkish, and Uzbek lack gender categories, which can lead to confusion when repeating keywords in different sentences, making the meaning unclear. Students often struggle to grasp the gender differentiation of nouns, which takes considerable time.

Another task in our research was to identify verbs in Russian texts and analyse their semantic nuances – those that ensure the unity of aspect and tense in the narrative. This task was particularly difficult for students whose native language lacks the distinctions between categories of aspect and tense, which convey nuances of action and process completion

Also, verb prefixes significantly influence the semantic meaning of verbs in Russian. The example of this phenomenon is the verb *шёл* (went) with prefixes *при-* (came), *у-* (left), *за-* (went in), *вы-* (went out), *пере-* (crossed), and others. Incorrect use of these prefixes disrupts the flow of the text, impedes its comprehension, and undermines the communicative intent of the speech. This can leave the interlocutor puzzled.

All of these tasks involved various means of the IPC (both lexical-grammatical and syntactic) and were given as additional tasks and tasks for independent work.

The **second method** involves the mechanism of structural and semantic organization of speech (SSO). It focuses on students' ability to identify and produce meaningful text segments – paragraphs and complex syntactic units.

Again, as in our previous experiment (Gabdulkhakov et al., 2022), we defined a paragraph as a coherent text segment composed of two main parts: 1) an introductory sentence encapsulating the central idea or key information, 2) an explanatory section that elaborates and supports the main idea.

A complex syntactic unit is understood as a text segment addressing a specific microtheme and consisting of three parts: 1) an opening sentence indicating the microtheme, 2) the middle part, revealing the microtheme, 3) the ending, completing the microtheme.

Notably, the boundaries between paragraphs and complex syntactic units can either coincide or diverge. Students were tasked with examining this phenomenon and clarifying its nature.

The research activities involved identifying text segments, delineating their boundaries, formulating main ideas and microthemes, creating outlines for completed texts and their own compositions, as well as summarizing and making their own statements.

The **third approach** focuses on achieving stylistic unity of speech (OSU). This method involves applying stylistic devices (lexical, morphological, syntactic) that are typically associated with scientific, literary, journalistic, or business styles. Inadequate command of a second language often results in the intermingling of linguistic elements from various styles, which impedes the communicative function and makes speech difficult to understand.

The tasks were to identify linguistic tools that are typical for specific styles of speech, and to use appropriate stylistic techniques in the text.

Results

The results of completing the experimental tasks are presented in Tables 1-3.

Table 1. Percentage of students who correctly completed the IPC tasks.

	experimental groups		**control groups**	
The number of students	before the experiment	after the experiment	before the experiment	after the experiment
	7	48	7	10

Table 1 demonstrates the findings of our experimental IPC tasks. The outcomes were substantial: in the experimental groups, 41% more students succeeded in completing the IPC, compared to a mere 3% increase in the control groups.

The outcomes of the experimental SSO tasks are detailed in Table 2.

Table 2. Percentage of students who correctly completed the SSO tasks.

	experimental groups		**control groups**	
The number of students	before the experiment	after the experiment	before the experiment	after the experiment
	4	46	4	6

As can be seen from Table 2, the difference also turned out to be weighty: the number of students from the experimental groups who successfully implemented SSO increased by 42%, whereas in the control groups, the increase was only 2%.

The results of completing the OSU tasks are detailed in Table 3.

Table 3. The percentage of students who successfully implemented OSU tasks.

	experimental groups		**control groups**	
The number of students	before the experiment	after the experiment	before the experiment	after the experiment
	7	53	8	12

As we can observe, the experimental groups showed a 46% increase in students successfully completing the OSU tasks, compared to only a 4% increase in the control groups

Altogether, during the experiments, about half of the students – 48% at IPC, 46% at SSO, and 53% at OSU – successfully mastered the fundamental principles of text organization, marking a significant educational achievement.

Thus, the research-oriented methodology for mastering coherent speech can be applied across various languages. This approach fosters independent work, trains students to contrast the distinctive features of two languages, and facilitates the positive transfer of linguistic elements from one language to another. It also helps learners overcome negative interference from one language on another, and it enhances their ability to analyze and construct coherent texts in both their native and second languages.

Discussion

The findings presented in Tables 1, 2, and 3 reveal a significant gap in contemporary educational theory concerning the teaching of coherent speech skills in the context of bilingualism. Our pedagogical experiments have demonstrated the effectiveness of integrating linguistic tools from text theory into students' independent research activities.

Our similar experiments conducted at the preschool education level have been highly appreciated (Gabdulkhakov et al., 2022).

Whereas at the end of the 20th century, there was a notable interest in teaching coherent speech (first programs, specialized courses, and methodological guides on text linguistics appeared), this interest has subsequently decreased at the beginning of the 21st century. In the methodological literature from different countries (Brutt-Griffler, 2017; Calderón et al., 2018; New York State Education Department, 2018), the issues of teaching coherent speech are mentioned only indirectly.

In university practice, it is commonly believed that the practical application of linguistic text theory tools has become largely the domain of programmers working on machine translation and the advancement of artificial intelligence. As a result, students often become accustomed to AI's ability to generate text on any topic and consequently lose interest in independent creative work.

Our research demonstrates that coherent speech in two languages can be successfully mastered through the consistent application of research-oriented pedagogical methodologies.

Conclusion

Transitioning from traditional pedagogical strategies to research-oriented methodologies empowers students to actively engage in research as they master coherent speech. This facilitates their involvement in the analysis of text structure, transforming them from passive recipients into active contributors to the learning process.

Our hypothesis that understanding text construction mechanisms in different languages and their practical application enhances the quality of coherent speech has been confirmed.

Mastering these mechanisms (IPC, SSO, and OSU) is essential for students' communicative development and successful second language acquisition.

The introduction of innovative research-oriented technologies offers new perspectives in bilingual education theory and practice.

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