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DEVELOPING STUDENTS' LINGUISTIC THINKING WITH ARTIFICIAL INTELLIGENCE: A PSYCHOLINGUISTIC PERSPECTIVE

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Abstract
The integration of artificial intelligence (AI) into education has transformed approaches to developing students' cognitive and linguistic capacities. Linguistic thinking, understood as the ability to comprehend, analyze, and generate meaning through language, represents a crucial component of intellectual development in higher education. From a psycholinguistic perspective, language and thought are deeply interconnected, as language constitutes the material form of thought and simultaneously mediates cognitive processes. This article explores the significance of employing AI-based technologies to enhance linguistic thinking, arguing that AI tools, when harmonized with psycholinguistic principles, create favorable conditions for fostering analytical, synthetic, and creative modes of reasoning in students.

Keywords: Artificial Intelligence; Linguistic Thinking; Psycholinguistics; Higher Education; Communicative Competence; Pedagogical Innovations; Digital Learning.

Introduction

The relationship between language and thought has remained one of the central issues in the history of human intellectual development. Language serves as the material expression of thought, while thought, in turn, provides meaning to language. This dialectical interdependence has been the subject of extensive scholarly inquiry across linguistics, psychology, pedagogy, and philosophy. In the context of higher education, the development of students 'linguistic thinking—that is, the ability to perceive, process, and creatively apply linguistic

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units in communicative activities—constitutes a pressing academic and pedagogical priority.

In recent decades, the rapid advancement of information and communication technologies has reshaped educational practices on a global scale. Particularly, artificial intelligence (AI) has emerged as one of the most influential innovations, offering unprecedented opportunities for personalization, interactivity, and adaptability in the learning process. Within the framework of mother tongue and language education, AI technologies provide not only technical support but also methodological foundations for shaping linguistic thinking in accordance with psycholinguistic principles. By simulating cognitive functions such as memory, analysis, and synthesis, AI enhances students 'engagement with language and facilitates deeper intellectual development.

From a psycholinguistic perspective, the process of forming linguistic thinking in students involves multiple interconnected stages: perception of linguistic units, analytical processing, synthesis of new ideas, and the transition to creative, independent reasoning. Classical theories proposed by scholars such as Vygotsky, Luria, and Chomsky underscore that linguistic development cannot be separated from the functioning of thought and cognitive activity. AI-based technologies, when applied in harmony with these theoretical insights, strengthen each stage of this developmental process. For instance, intelligent tutoring systems can adapt tasks to students 'cognitive capacities, multimedia platforms can enrich semantic perception through visual and auditory modalities, and AI-powered interactive tools can stimulate creative language production. Moreover, the integration of AI into education aligns with contemporary demands for innovation and inclusivity. Traditional methods of language teaching, though essential, may not fully address the needs of digital-native students who require dynamic, engaging, and contextually relevant learning environments. AI offers the potential to combine traditional psycholinguistic insights with modern technological solutions, thereby ensuring a balanced and comprehensive approach. Such integration not only enhances linguistic competence but also nurtures critical thinking, problem-solving, and creativity—skills essential for intellectual independence and professional success in the 21st century. Therefore, the present study argues that developing students 'linguistic thinking through artificial intelligence requires a multidimensional approach that synthesizes psycholinguistic theory, pedagogical innovation, and technological advancement.

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This paper examines how AI-based tools and platforms can be effectively utilized in the educational process to foster communicative competence, strengthen cognitive abilities, and promote creative linguistic activity. Ultimately, the integration of AI into mother tongue and language education contributes to the preparation of intellectually capable, socially responsible, and culturally aware individuals who can navigate the challenges of a globalized world.

The concept of linguistic thinking is explained as a form of thought directly related to language. A person expresses logical reasoning through language, while language serves as the external form of thought. The scientific views of scholars such as Vygotsky, Chomsky, and Luria demonstrate the dialectical interrelation between language and thought. The process of forming linguistic thinking in students includes several stages [1, p.45]:

- **Perceptive stage** – the student perceives linguistic units through listening and reading;
- **Analytical stage** – the perceived units are processed in the mind, and semantic relations are identified;
- **Synthetic stage** – new ideas are generated on the basis of linguistic units;
- **Creative stage** – the student transitions to free, independent, and creative thinking in speech activity.

The relationship between language and thought has attracted scholarly attention since the earliest stages of human development. Human thought is formed through language, while language itself represents the material expression of thought. Therefore, the issue of language and thought is not only a concern for linguistics but also for psychology, pedagogy, and philosophy. In mother tongue education, addressing this issue requires deeper methodological inquiry. The process of forming linguistic thinking in students goes beyond mere knowledge transmission or language instruction; it is directly linked with conscious perception, memory, speech production mechanisms, and psychological processes. The emergence of psycholinguistics as a discipline enabled the scientific study of complex interactions between language and thought. The intellectual heritage of scholars such as Vygotsky, Luria, and Chomsky illustrates that language perception, speech production, and the processing of semantic units in the mind are intrinsically connected to the development of thought. From this perspective, the formation of linguistic thinking in students psycholinguistically encompasses perception, memory, internal and external speech, and semantic

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analysis. The core of the psycholinguistic approach in mother tongue education lies in ensuring that linguistic units are assimilated not merely from grammatical or lexical aspects but in harmony with psychological and cognitive processes [2, p.56]. During the process of learning a language, students process it mentally, analyze it, and apply it in speech activity. This strengthens thinking, develops logical reasoning, and fosters creativity. In recent years, the use of pedagogical innovations in mother tongue education has elevated this process to a more effective level. Multimedia tools, digital platforms, artificial intelligence technologies, and interactive methods enliven the educational process, enhance perception, and develop independent thinking skills in students. Through multimedia storytelling, students not only read or listen to texts but also perceive them through visual and auditory means, expanding their imagination. Interactive methods, such as clustering, brainstorming, and conceptual mapping, support the development of analytical thinking. Artificial intelligence–based applications and digital learning platforms adapt to the individual cognitive capacities of each student, enabling differential approaches. "The integration of psycholinguistic approaches and pedagogical innovations in education serves to develop communicative competence, activate speech activity, and foster independent and creative thinking among students" [3, p.89].

Pedagogical innovations in mother tongue education function not only as effective means of delivering material but also as methodological foundations that encourage independent inquiry, develop thinking, and reveal creative potential. Digital platforms and AI technologies not only expand students ' cognitive capacities but also increase learning motivation by introducing interactivity, immediacy, and individualization. This fosters a positive psychological disposition towards learning and accelerates the formation of linguistic thinking. At the same time, balancing traditional methods with modern innovations remains crucial. Relying solely on new technologies may neglect classical foundations of language and thought, while depending exclusively on traditional methods risks disengaging today's learners. Therefore, a balanced approach is required, integrating psycholinguistic theories, classical didactic principles, and innovative technologies into a unified methodological system. Empirical research demonstrates that psycholinguistically organized lessons enhance not only students 'speech activity but also their critical thinking, creativity, and decision-making skills. This directly serves one of the key

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objectives of modern education – fostering intellectual capacity. Consequently, in mother tongue education, the effective formation of linguistic thinking through the integration of psycholinguistic approaches and pedagogical innovations possesses both theoretical and practical significance. Innovative technologies are increasingly recognized as essential for enhancing the effectiveness of mother tongue education. For instance, gamification introduces play-based learning elements, motivating students and encouraging active participation. Digital platforms broaden opportunities for independent learning, offering flexible approaches tailored to individual interests and needs. This develops not only linguistic thinking but also independent study and knowledge acquisition skills.

The integration of artificial intelligence into the process of developing students ' linguistic thinking provides a transformative opportunity to enhance both cognitive and communicative competencies in higher education. From a psycholinguistic perspective, linguistic thinking is not limited to the acquisition of grammatical or lexical knowledge; rather, it encompasses perception, analysis, synthesis, and creative reasoning, all of which are closely tied to language. Artificial intelligence, with its capacity to personalize learning, simulate cognitive processes, and create interactive environments, offers a unique means of reinforcing these stages. Intelligent tutoring systems, adaptive platforms, and AI-assisted storytelling stimulate not only linguistic competence but also logical reasoning, critical analysis, and creativity. Furthermore, the effective integration of AI requires a balanced approach in which classical psycholinguistic theories, traditional pedagogical principles, and modern technological innovations are harmonized. Overreliance on either traditional methods or purely technological tools may limit the depth of educational outcomes. Instead, a combined methodology ensures that students develop comprehensive skills, ranging from linguistic proficiency to independent and critical thinking. Such an approach reflects the broader aims of contemporary education, which seeks not only to impart knowledge but also to foster intellectual independence, problem-solving ability, and cultural awareness.

The integration of artificial intelligence into the development of students ' linguistic thinking represents a significant advancement in modern education. From a psycholinguistic perspective, linguistic thinking is a multidimensional process encompassing perception, analysis, synthesis, and creativity, all of which are deeply connected to language. Artificial intelligence enhances these processes

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by providing interactive, adaptive, and student-centered learning environments. Intelligent tutoring systems, AI-based storytelling, and multimodal resources not only strengthen linguistic competence but also foster logical reasoning, critical thinking, and creative problem-solving skills. However, the effectiveness of this integration depends on a balanced approach that harmonizes classical psycholinguistic theories, traditional pedagogical principles, and modern technological innovations. Such synthesis ensures the development of both linguistic proficiency and broader cognitive competencies, aligning education with the intellectual and cultural needs of the 21st century. Recommendations:

1. Integration into Curricula – Incorporate AI tools systematically into language education curricula to support the psycholinguistic development of students.
2. Balanced Methodology – Combine AI technologies with traditional methods to achieve comprehensive cognitive and linguistic outcomes.
3. Teacher Training – Provide professional development for educators on AI applications and psycholinguistic strategies to ensure effective implementation.
4. Student-Centered Approaches – Use AI platforms to personalize learning pathways, enhancing motivation, independence, and creativity.
5. Multimodal Resources – Develop and utilize multimedia and AI-driven resources, such as interactive storytelling and gamified platforms, to enrich perception and memory.
6. Cultural Adaptation – Ensure that AI applications are adapted to multilingual and cultural contexts, thereby fostering not only linguistic skills but also national identity and values.

By implementing these recommendations, educational institutions can establish an innovative and sustainable model of mother tongue and language education. This model strengthens linguistic thinking, cultivates intellectual independence, and prepares students to meet the challenges of an increasingly digital and globalized society.

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