THE ROLE OF ARTIFICIAL INTELLIGENCE IN TEACHING ENGLISH

Guldana Temirkhan, Mekemtas Asylym
Karaganda Buketov University
Prepared by 3rd-year student
of the Faculty of Philology
Scientific Advisor: **Maxat Zhumassatuly**
Karaganda Buketov National Research University,

Abstract: This research paper delineates the ontological and functional aspects of Artificial Intelligence (AI) technologies within the contemporary linguistic educational space. The study aims to substantiate the effectiveness of AI tools, particularly Large Language Models (LLMs) such as ChatGPT, in enhancing students' lexical competence through a cognitive linguistics lens. The experimental intervention was conducted at Besoba School in the Karakaraly district of the Karaganda region, analyzing AI's potential in constructing a sophisticated, personalized learning trajectory. Methodologically, the research bridges traditional pedagogical theories with modern neural network capabilities. The empirical results demonstrate that AI-based interaction yields a significantly higher performance in the consolidation and retrieval of lexical units compared to traditional linear teaching models. By leveraging adaptive algorithms, AI deconstructs the affective barriers typically associated with secondary language acquisition, facilitating a more profound semantic integration. This study contributes to the burgeoning field of cyber-pedagogy by providing a validated framework for digital linguodidactic intervention.

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1. Introduction

The integration of Artificial Intelligence (AI) into the global educational architecture represents the culmination of a multi-decadal evolution in linguistic and pedagogical thought. Far from a mere technological trend, AI represents a fundamental shift in how human cognition interfaces with synthesized information. The historical trajectory of machine intelligence in linguistics began in the mid-20th century with Alan Turing’s (1950) seminal inquiry into the "thinking capacity of computing machinery," which established the mathematical possibility of linguistic algorithms. This was further catalyzed by Noam Chomsky’s (1957) "Syntactic Structures," which introduced generative grammar, thereby providing a formal framework for machine-level linguistic generation.

By the 1980s, the field transitioned toward cognitive application. Stephen Krashen’s "Comprehensible Input" theory offered a vital heuristic for understanding language acquisition, suggesting that learners thrive when exposed to content slightly above their current competence. Contemporary AI actualizes this theory through real-time data processing, adjusting complexity with a precision previously unattainable. Furthermore, the constructionist perspectives of Seymour Papert and the meta-analytical findings of John Hattie (2008) underscore the necessity of immediate feedback—a hallmark of neural network interaction—in optimizing cognitive outcomes.

In the Eurasian context, the pedagogical cornerstone remains Lev Vygotsky's (1934) "Zone of Proximal Development" (ZPD). This concept explains the efficacy of AI as a digital "scaffold" that personalizes the educational experience based on individual variance. Complementary to this, the Russian school, represented by Uznadze (1966) and Voronin (1982), explored the psycholinguistic correlations between sound and semantics, laying the groundwork for modern phonosemantics in machine analysis. Recently, Kazakhstani scholars such as Kurmanbayeva (2018) and Zhumassatuly and Assanov (2024) have localized these global trends, emphasizing AI's unique capacity for immediate corrective feedback and lexical enrichment within the national curriculum. This study builds upon these established scientific pillars to analyze the current digital transformation in rural educational settings.

2. Method

This study employed a quasi-experimental research design to evaluate the efficacy of AI-driven linguistic intervention. The methodology is rooted in the principles of neurodidactics, focusing on the cognitive mechanisms of lexical retention. By utilizing a pre-test/post-test framework, the research sought to isolate the variable of AI interaction within a controlled pedagogical environment. The primary objective was to observe the transition from passive vocabulary recognition to active semantic production. The methodological approach integrated quantitative statistical analysis with qualitative reflective surveys to ensure a holistic understanding of the technological impact on the learners' cognitive architecture.

2.1 Participants

The experiment involved students from the 7th "A" grade of Besoba School in the Karakaraly district. The total number of respondents was 15, consisting of 9 girls and 6 boys. The participants were aged between 12 and 13 years. The students' English proficiency level was Pre-Intermediate (A2). All participants possessed a normal level of digital literacy and the ability to work with technological devices (smartphones, laptops). Participation was voluntary, and students were fully briefed on the research procedure.

2.2 Materials

The following materials and platforms were utilized during the study: ChatGPT (OpenAI): For generating lexical texts and dialogues adapted to students' individual levels. Quizlet AI: A set of interactive flashcards for reinforcing vocabulary through gamification. Google Forms: For collecting diagnostic and final test results. Curriculum: Thematic blocks "Space and Earth" and "Global Issues" designated for the 7th grade.

2.3 Procedure

The study consisted of three main stages. Preparatory Stage: Students' initial knowledge levels were assessed via a pre-test. Instructions on working with AI tools were provided. For four weeks, the acquisition of new vocabulary was conducted using ChatGPT. Students performed tasks such as asking AI for contextual meanings, identifying synonyms, and engaging in AI-driven dialogues. A post-test was administered, and results were compared using the statistical t-test method. Additionally, a reflective survey was conducted to gauge student experiences.

2.4 Data Analysis

The analysis of the gathered data involved a comparative evaluation of pre-intervention and post-intervention scores using a paired-sample t-test. The statistical results indicated a significant upward shift in lexical retention; the mean score for vocabulary consolidation rose from a baseline

of 55% to an impressive 85% following the four-week period. This 30% increase suggests a high correlation between AI-driven adaptive learning and long-term memory encoding. The data further revealed that the "immediate feedback" loop significantly reduced the time-to-retrieval for complex terms, suggesting that AI accelerates the transition of information from short-term to long-term cognitive storage.

3. Conclusion

The findings of this research provide a robust scientific validation of the transformative role Artificial Intelligence plays within modern linguodidactics. By synthesizing the historical linguistic frameworks of Turing and Chomsky with the cognitive theories of Krashen and Vygotsky, this study demonstrates that AI is not merely a supplementary tool but a fundamental catalyst for linguistic development. The data derived from Besoba School illustrates that the implementation of neural networks in a secondary school environment effectively simulates the "Zone of Proximal Development" on an individualized scale. This algorithmic personalization allows for a degree of differentiation that was previously labor-prohibitive in traditional classroom settings.

From a neurocognitive perspective, the success of the intervention is largely attributable to the reduction of the "affective filter." Students interacting with AI agents reported lower levels of performance anxiety, which facilitated a more exploratory and frequent use of target lexis. The generative nature of AI tools like ChatGPT ensures that the "input" provided to the student is not only comprehensible but also contextually relevant to their personal interests, thereby enhancing semantic salience. This aligns with the findings of Zhumassatuly and Assanov (2024), who posited that AI’s unique corrective feedback loop is essential for the refinement of pronunciation and syntactical accuracy.

Furthermore, the research underscores that AI serves as a "methodological partner" for the educator rather than a replacement. It enables the teacher to shift from a role of primary information source to a facilitator of high-level cognitive engagement. The experimental evidence clearly shows that the synergy between human pedagogical oversight and machine-driven adaptive drills creates an optimal environment for lexical acquisition. In conclusion, the integration of AI into English language teaching represents a qualitative leap in educational efficacy. As neural networks continue to evolve, they will inevitably become the central nervous system of personalized education, offering rural and urban students alike an equitable path to linguistic mastery. Future research should expand this scope to analyze the long-term impact of AI on complex syntactical development and spontaneous fluency over extended academic periods.

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