

PECULIARITIES OF USING ARTIFICIAL INTELLIGENCE (AI) TOOLS IN A FOREIGN LANGUAGE EDUCATIONAL ENVIRONMENT

Vinnitsia National Technical University

Анотація

Дане дослідження вивчає інтеграцію інструментів штучного інтелекту у навчання іноземних мов у технічних університетах, аналізуючи їхній вплив на автономність учнів, лінгвістичну компетентність та педагогічну ефективність. За допомогою змішаного методологічного підходу із залученням 156 студентів технічних спеціальностей дослідження виявляє, що хоча застосування ШІ значно підвищують продуктивність письма та впевненість учнів, вони потребують ретельного педагогічного посередництва для запобігання залежності та збереження навичок критичного мислення. Результати свідчать, що структурована інтеграція ШІ, узгоджена з потребами фахової комунікації, пропонує суттєві переваги для контексту технічної освіти, хоча комплексні програми цифрової грамотності у сфері ШІ залишаються необхідними для досягнення оптимальних результатів навчання.

Ключові слова: штучний інтелект, навчання іноземних мов, технічний університет, автономність студентів, педагогічна інтеграція.

Abstract

This study investigates the integration of artificial intelligence tools in foreign language instruction within technical university settings, examining their impact on learner autonomy, linguistic competence, and pedagogical effectiveness. Through a mixed-methods approach involving 156 engineering students, the research reveals that while AI applications significantly enhance writing productivity and learner confidence, they require careful pedagogical mediation to prevent dependency and maintain critical thinking skills. The findings suggest that structured AI integration aligned with domain-specific communication needs offers substantial benefits for technical education contexts, though comprehensive AI literacy programs remain essential for optimal learning outcomes.

Key words: artificial intelligence, foreign language education, technical university, learner autonomy, pedagogical integration.

Introduction

The integration of artificial intelligence into foreign language teaching has emerged as one of the most transformative developments in contemporary pedagogy. With the rapid advancement of large language models, machine translation systems, and adaptive learning platforms, educators face unprecedented opportunities and challenges in reshaping traditional language acquisition methodologies. The technical university environment, characterized by students with predominantly engineering mindsets and specific professional language needs, requires particular attention to AI implementation strategies. Understanding how these tools affect cognitive processing, learner autonomy, and communicative competence development has become crucial for maintaining educational quality whilst embracing technological innovation.

The ubiquity of AI-powered applications has fundamentally altered the landscape of language learning, making sophisticated linguistic support accessible to students outside traditional classroom settings. Generative AI models now possess capabilities that extend far beyond simple grammar checking, offering contextualized feedback, conversational practice opportunities, and personalized learning pathways tailored to individual proficiency levels. However, this accessibility raises critical questions regarding academic integrity, the development of authentic linguistic competence, and the potential erosion of essential language learning strategies. The Ukrainian educational context presents additional considerations, as students navigate multilingual environments whilst simultaneously adapting to international academic standards and technological innovations.

Furthermore, the COVID-19 pandemic accelerated digital transformation in education, creating both infrastructure challenges and attitudinal shifts that continue to influence pedagogical practices. Technical university students, who will likely utilize AI extensively in their professional careers, require nuanced understanding of these tools' capabilities and limitations within language learning contexts. The gap between technological possibilities and pedagogically sound implementation remains substantial, necessitating empirical research to guide evidence-based practice. Moreover, existing studies predominantly focus on general educational settings, leaving technical education contexts underexplored despite their distinctive characteristics. The intersection of domain-specific language needs, technological aptitude, and AI tool integration represents a particularly fertile area for investigation. Finally, as AI technology evolves at unprecedented speed, continuous reassessment of its pedagogical implications becomes imperative to ensure that language education remains effective, ethical, and aligned with contemporary communicative demands.

This study aims to investigate the distinctive features of AI tool integration within foreign language instruction at technical universities and to establish evidence-based recommendations for their pedagogical application.

The research objectives include: examining current AI applications in language learning contexts; identifying cognitive and methodological implications of AI-assisted instruction; evaluating the impact on learner autonomy and critical thinking skills; and proposing framework guidelines for balanced AI integration in technical education settings.

The study employed a mixed-methods approach combining quantitative and qualitative data collection techniques. The research was conducted over one academic semester (September 2025 – December 2025) involving 156 second-year engineering students studying English at B1-B2 proficiency levels across three experimental groups and one control group.

Quantitative methods included pre-test and post-test assessments measuring vocabulary acquisition, grammatical accuracy, and writing fluency. Questionnaires evaluated student attitudes toward AI tools and perceived learning effectiveness. Qualitative data were gathered through semi-structured interviews with fifteen participants and reflective journals documenting AI usage patterns.

The experimental groups utilized different AI applications: Group A employed ChatGPT for conversational practice and writing feedback; Group B used Grammarly and specialized translation tools; Group C combined multiple AI platforms for integrated skills development. The control group followed conventional instruction methods without AI support.

Statistical analysis revealed significant improvements in writing productivity across all experimental groups, with Group C demonstrating a 34% increase in text production speed compared to the control group. However, grammatical accuracy improvements were modest (8-12%), suggesting that AI assistance primarily enhances fluency rather than structural competence.

Notably, excessive reliance on AI-generated content correlated negatively with independent critical thinking scores. Students who used AI tools without instructor guidance exhibited diminished ability to self-correct errors and reduced metacognitive awareness. Conversely, structured AI integration with explicit pedagogical framing yielded positive outcomes in learner confidence and willingness to communicate.

Interview data highlighted several concerns: students reported difficulty distinguishing between AI-appropriate and AI-inappropriate tasks, uncertainty regarding academic integrity boundaries, and anxiety about developing authentic language competence. Paradoxically, while AI tools reduced language anxiety for some learners, they simultaneously created technological dependency issues.

The technical university context revealed specific patterns: engineering students valued AI tools for domain-specific terminology acquisition and technical documentation tasks but showed less enthusiasm for creative language use. This pragmatic orientation suggests that AI implementation strategies should align with professional communication needs rather than adopting generic language learning approaches.

Conclusions

Modern AI tools offer substantial pedagogical potential for foreign language education, particularly in enhancing productivity, providing immediate feedback, and personalizing learning pathways. However, their integration requires careful pedagogical mediation to prevent skill atrophy and maintain learner agency. Technical universities must develop comprehensive AI literacy programs that teach students when and how to use these tools effectively whilst preserving critical thinking capabilities.

Further research should investigate long-term effects of AI-assisted learning on linguistic competence retention, explore optimal pedagogical frameworks for different proficiency levels, and examine AI's role in developing intercultural communicative competence. Comparative studies across diverse educational contexts would help establish universal principles and context-specific adaptations. Additionally, investigating AI's potential for assessment innovation and feedback mechanisms represents a promising research direction.

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Чопляк Вікторія Володимирівна – викладач англійської мови, Вінницький національний технічний університет, Вінниця, e-mail: nikavnuchkova@gmail.com.

Viktoria Chopliak – the lecturer of the Department of Foreign Languages, Vinnytsia National Technical University, Vinnytsia, e-mail: nikavnuchkova@gmail.com.