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GENERATIVE ARTIFICIAL INTELLIGENCE IN THE TEACHING OF THE AZERBAIJANI LANGUAGE: PEDAGOGICAL POSSIBILITIES, LANGUAGE COMPETENCE, AND ACADEMIC INTEGRITY

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Summary

This article examines the application of generative artificial intelligence (AI) technologies in the teaching of the Azerbaijani language from pedagogical, linguodidactic, and ethical perspectives. The primary objective of the study is to provide a conceptual analysis of the potential impact of generative AI on the development of language competence, the didactic opportunities it offers within the learning process, and the challenges it presents regarding academic integrity. The research employs an analytical review of scientific literature, comparative analysis, and conceptual generalization. UNESCO's recommendations on the use of AI in education and research, alongside international studies exploring the development of writing skills through generative AI, serve as the theoretical and methodological framework. The study substantiates the potential of generative AI in Azerbaijani language instruction, specifically in areas such as text generation, the identification of orthographic and grammatical errors, lexical-semantic analysis, the provision of personalized feedback, and the development of communicative skills. Furthermore, the study analyzes risks such as learners' excessive reliance on technology, the acquisition of inaccurate linguistic information, ambiguity regarding authorship, and the violation of academic integrity principles. It emphasizes the necessity of pedagogically evaluating artificial intelligence tools within the context of the Azerbaijani language's structural features, its national-cultural content, and the development of its digital resources. Consequently, a human-centered implementation model is proposed, which integrates instructor supervision, active learner participation, and transparent assessment.

Keywords: generative artificial intelligence, teaching the Azerbaijani language, language competence, digital pedagogy, linguodidactics, academic writing, academic integrity, formative assessment.

AZƏRBAYCAN DİLİNİN TƏDRİSİNDƏ GENERATİV SÜNİ İNTELLEKT: PEDAQOJİ İMKANLAR, DİL KOMPETENSİYASI VƏ AKADEMİK DÜRÜSTLÜK

Xülasə

Məqalədə generativ süni intellekt texnologiyalarının Azərbaycan dilinin tədrisində tətbiqi pedaqoji, linqvodidaktik və etik aspektlərdən araşdırılır. Tədqiqatın əsas məqsədi generativ süni intellektin dil kompetensiyasının inkişafına potensial təsirini, təlim prosesində yaratdığı didaktik

imkanları və akademik dürüstlüklə bağlı meydana çıxan problemləri konseptual baxımdan təhlil etməkdir. Tədqiqatda elmi ədəbiyyatın analitik icmalı, müqayisəli təhlil və konseptual ümumiləşdirmə metodlarından istifadə olunur. UNESCO-nun süni intellektin təhsil və tədqiqatda tətbiqinə dair tövsiyələri, eləcə də generativ süni intellekt vasitəsilə yazı bacarıqlarının inkişafını araşdıran beynəlxalq tədqiqatlar nəzəri-metodoloji baza kimi nəzərdən keçirilir. Araşdırmada generativ süni intellektin Azərbaycan dili təlimində mətn yaratma, orfoqrafik və qrammatik səhvlərin müəyyənləşdirilməsi, leksik-semantik təhlil, fərdiləşdirilmiş geribildirim və kommunikativ bacarıqların inkişafı baxımından potensialı əsaslandırılır. Bununla yanaşı, dil öyrənənlərin texnologiyadan həddindən artıq asılılığı, yanlış dil məlumatlarının mənimsənilməsi, müəlliflik məsuliyyətinin qeyri-müəyyənliyi və akademik dürüstlük prinsiplərinin pozulması kimi risklər təhlil edilir. Azərbaycan dilinin struktur xüsusiyyətləri, milli-mədəni məzmunu və rəqəmsal resurslarının inkişafı kontekstində süni intellekt vasitələrinin pedaqoji baxımdan qiymətləndirilməsinin zəruriliyi vurğulanır. Nəticədə müəllim nəzarətini, öyrənənin fəal iştirakını və şəffaf qiymətləndirməni birləşdirən insanmərkəzli tətbiq modeli təklif edilir.

Açar sözlər: generativ süni intellekt, Azərbaycan dilinin tədrisi, dil kompetensiyası, rəqəmsal pedaqogika, linqvodidaktika, akademik yazı, akademik dürüstlük, formativ qiymətləndirmə.

Introduction

The rapid development of digital technologies necessitates a re-evaluation of the mechanisms for presenting, acquiring, and assessing knowledge within the education system. In particular, the capabilities of generative artificial intelligence systems-such as generating text, answering questions, editing content, explaining complex concepts, and preparing educational materials tailored to user requests-have introduced new approaches to organizing the learning process. Beyond transforming the nature of interaction between teachers and learners in language education, these technologies also expand opportunities for personalized learning, immediate feedback, and independent study. Large language models are utilized in the educational process for tasks such as generating text, summarizing information, answering questions, and providing feedback on written work. (Kasneci et al., 2023). In a UNESCO guidance document prepared by Miao and Holmes, it is emphasized that the application of generative artificial intelligence in education must be based on principles such as a human-centered approach, data protection, inclusivity, and the safeguarding of cultural and linguistic diversity. (Miao & Holmes, 2023). This approach requires viewing artificial intelligence in education not merely as a technical tool, but as a complex learning environment that must be managed in alignment with pedagogical objectives. Language instruction is a field of particular significance for the application of generative artificial intelligence. Language acquisition is not limited to the study of grammatical rules; it also encompasses the enrichment of vocabulary, the ability to construct texts, the understanding of semantic relationships, the selection of expressions appropriate to a given communicative situation, and the capacity for critical thinking. While artificial intelligence can support the development of these skills, the accuracy and pedagogical value of the text it generates are not automatically guaranteed. In the context of teaching the Azerbaijani language, this issue takes on additional scholarly significance. The agglutinative structure of the Azerbaijani language-characterized by the sequential combination of suffixes, specific morphological and syntactic

relationships, word order, stylistic differentiation, and layers of national-cultural meaning-necessitates a separate verification of the outputs provided by artificial intelligence systems. Given that multilingual artificial intelligence systems generally exhibit varying levels of performance across different languages, it is essential to evaluate texts generated in the Azerbaijani language from both linguistic and pedagogical perspectives. The relevance of this topic stems from the need to examine-within a single research framework-both the capabilities of generative artificial intelligence and the methodological and ethical challenges it presents. The core issue here is not merely acknowledging the existence of this technology, but rather determining the conditions under which it can contribute to the development of language competence.

The purpose of this research is to investigate-at a theoretical and methodological level-the possibilities for applying generative artificial intelligence (AI) in the teaching of the Azerbaijani language, its potential impact on the development of language competence, and the challenges it poses regarding academic integrity; the study also aims to formulate a pedagogically sound model for its implementation. In line with this objective, the following tasks have been defined:

1. To systematize the functions and pedagogical potential of generative AI in language instruction.

2. To identify specific ways in which AI can be utilized to develop lexical, grammatical, orthographic, and text-creation skills in the Azerbaijani language.

3. To analyze issues concerning the accuracy, stylistic appropriateness, and national-cultural adequacy of texts generated by AI.

4. To evaluate the implications of using AI with regard to academic integrity, authorship responsibility, and independent learning.

5. To propose a pedagogical implementation model based on instructor supervision and the active participation of the learner. The research is of a theoretical and conceptual nature. The primary methods employed include an analytical review of scientific literature, comparative analysis, conceptual generalization, and pedagogical modeling. Findings from international research are examined to identify approaches that are methodologically significant for the instruction of the Azerbaijani language. A key methodological limitation of this study is that it does not present results from a specific experiment conducted with learners of the Azerbaijani language. Consequently, certain pedagogical possibilities are framed as theoretically grounded potential, while the empirical verification of their actual effectiveness remains a task for future research.

Generative artificial intelligence is a collection of technologies capable of creating new texts and other forms of content based on large volumes of data. In language instruction, these systems are notable for their ability to generate explanations, examples, texts, exercises, corrections, and feedback. Their pedagogical significance lies not merely in the rapid presentation of information, but in their potential to facilitate the learner's active engagement with language material. However, the mere availability of a response generated by artificial intelligence should not be equated with the achievement of learning outcomes. A learner might receive a finished text without necessarily grasping its grammatical structure, semantic relationships, or stylistic features. Therefore, the use of generative artificial intelligence must be aligned with learning objectives, instructional tasks, and assessment criteria. In this regard, three theoretical perspectives are of particular importance. The first is the social-constructivist approach. This approach emphasizes the construction of

knowledge through active engagement and interaction. Artificial intelligence can provide the learner with alternative explanations and examples. However, for knowledge to be assimilated, it is essential for the learner to make comparisons, ask questions, identify errors, and independently justify their conclusions.

The second aspect concerns formative assessment and feedback. To develop written language skills, the learner must understand not only that an error exists, but also its cause and the principle for correcting it. Artificial intelligence can accelerate the provision of initial feedback. Nevertheless, automated corrections must be reviewed by the teacher and adapted to the learner's language proficiency level.

The third direction is human-centered digital pedagogy. According to UNESCO’s approach, the application of artificial intelligence in education should serve to safeguard human autonomy, equal opportunities, privacy, and linguistic and cultural diversity. (Miao & Holmes, 2023).

Therefore, the effectiveness of implementing technology should be evaluated not by the frequency of its use, but by the extent to which it aligns with learning objectives. Generative artificial intelligence can assist in presenting lexical and grammatical material at various proficiency levels when teaching the Azerbaijani language. Such capabilities include explaining a single grammatical rule through simple, intermediate, and complex examples; demonstrating the use of words within a specific context; comparing synonyms and antonyms; and performing syntactic analysis of sentences. For instance, an instructor might ask students to express a particular idea using both simple and complex sentences, or to present the same content in both formal and informal styles. Artificial intelligence can generate alternative examples, which students can then compare in terms of grammatical accuracy, semantic precision, and stylistic appropriateness. Given the agglutinative structure of the Azerbaijani language, the use of suffixes, the relationship between word roots and suffixes, the agreement of case and possessive markers, and the tense and person forms of verbs are of particular pedagogical significance. While artificial intelligence can generate additional exercises on these topics, the accuracy of the morphological analysis and standard forms it provides must be verified. Thus, the primary didactic function of the technology is not to offer ready-made answers, but rather to enable the learner to observe linguistic phenomena, make comparisons, and consciously internalize the rules.

Written expression is a complex indicator of language competence. The process of text creation encompasses several stages: defining the topic, planning ideas, structuring the text, constructing arguments, selecting linguistic resources, and editing. Generative artificial intelligence can serve as a support tool at various stages of this process. It can suggest alternatives for a text outline, identify weak connections between paragraphs, and offer recommendations for reducing lexical repetition. However, to ensure the development of the learner's written competence, the primary intellectual responsibility for the text's content and final version must remain with the learner. Research conducted by Mahapatra (2024) within the context of higher education examines the impact of feedback supported by generative artificial intelligence on the development of academic writing skills in English as a second language. While this research cannot be considered direct evidence regarding the Azerbaijani language, it provides a comparative methodological framework for examining feedback mechanisms in language learning. Applying such an approach in Azerbaijani language instruction can enable the

assessment of students' initial and final texts through a comparison of the number of grammatical errors, lexical diversity, the logical organization of the text, and the substantiation of arguments.

Since students possess varying levels of language proficiency, vocabulary, reading comprehension, and writing skills, a single, uniform task may not equally address the needs of every learner. Generative artificial intelligence can support differentiated instruction by creating texts and tasks of varying difficulty levels centered on the same topic. For instance, one student might be asked to identify the main idea of a text, another to compare arguments, and a more advanced learner to critically evaluate the author’s perspective. In this approach, the learning objective remains constant, while the complexity of the materials and activities used to achieve it is adjusted. Furthermore, the effectiveness of personalized instruction should not be measured solely by the sheer number of tasks provided. Teachers must ensure that the materials offered are appropriate for the students' age and language proficiency, align with the curriculum, and adhere to the normative rules of the Azerbaijani language.

One method to enhance the pedagogical value of generative artificial intelligence is to subject the text it generates to critical analysis. Students can be tasked with identifying grammatical errors, logical contradictions, unsubstantiated claims, stylistic inconsistencies, and information lacking sources within the text produced by the AI. This approach extends language instruction beyond the mere acquisition of technical skills; it also fosters the development of abilities such as fact-checking, evaluating arguments, and making independent decisions. Thus, artificial intelligence can serve both as a tool for generating linguistic material and as an object of critical analysis for examining the accuracy of that material.

When applying generative artificial intelligence to Azerbaijani language instruction, the language's structural and functional characteristics must be specifically taken into account. The fact that AI systems can generate text in Azerbaijani does not guarantee that the output will always be correct in terms of norms, semantics, and style. The first issue concerns morphological accuracy. Errors in the selection of suffixes, their attachment to word roots, phonetic assimilation, the use of case forms, or verb moods can lead the learner to internalize an incorrect linguistic model. The second issue relates to the precision of syntactic and semantic relationships. AI may generate sentences that appear correct on the surface but lack coherent logical connections. This is particularly significant when analyzing complex sentences, expressing cause-and-effect relationships, or editing academic texts. The third issue concerns stylistic and pragmatic appropriateness. Formal correspondence, academic articles, journalistic writing, and literary prose all involve the use of the same linguistic units, but in different functional ways; consequently, AI-generated texts may exhibit a confusion of styles. The fourth issue pertains to the adequate representation of national-cultural content. In the Azerbaijani language, proverbs, idioms, forms of address, national-cultural concepts, and historical connotations are not limited to their literal, dictionary definitions. Their accurate interpretation requires taking the cultural context into account. These challenges do not imply that artificial intelligence systems for the Azerbaijani language are invariably inaccurate; rather, they highlight the necessity for empirical testing across specific systems, tasks, and linguistic levels. Consequently, it is advisable to develop an evaluation framework for AI tools in the Azerbaijani language based on criteria such as morphological correctness, syntactic adequacy, semantic precision, stylistic appropriateness, and cultural sensitivity.

For the effective use of generative artificial intelligence in language instruction, a model is proposed that focuses on supporting specific stages of the learning process, rather than replacing the teacher's role. This model can be termed a tripartite interaction model: "Teacher – Learner – Artificial Intelligence." It consists of five sequential stages:

The first stage involves defining the initial language activity. The learner produces a text, completes a grammar exercise, or expresses their thoughts on a given topic without the use of artificial intelligence. This stage serves to establish the learner's existing knowledge and skills.

The second stage involves receiving feedback via artificial intelligence. The learner submits their text to the AI, requesting the identification of errors, explanations for those errors, and suggestions for alternative phrasings. The objective is not for the technology to generate the final text, but for the learner to refine their own work.

The third stage involves critical review. The learner evaluates the suggested corrections by comparing them against the norms of the Azerbaijani language, textbook content, and the teacher's explanations. They accept the corrections they deem appropriate, while further investigating any questionable suggestions.

The fourth stage involves independent editing and rewriting. The learner prepares the final version of the text themselves and provides a rationale for the changes made. This stage aims to foster a conscious grasp of linguistic rules and to maintain independent writing skills.

The fifth stage is reflection and evaluation. The initial and final versions of the text are compared. The learner explains which errors were corrected, which recommendations were not adopted, and what has been learned. The teacher evaluates the outcome based not only on the final text but also on the learning process and independent thinking. The primary advantage of the proposed model is that the immediate feedback capabilities of artificial intelligence are integrated with the learner's independent work. The effectiveness of this model in the context of Azerbaijani language instruction, however, remains to be verified through future empirical research.

The integration of generative artificial intelligence into the educational system necessitates a reinterpretation of the concept of academic integrity. In a traditional academic environment, students are expected to be the authors of the work they submit and to cite the sources they have used. When artificial intelligence is employed, it becomes essential to clearly define the boundaries between the author's own intellectual contribution, the role of the technology, and the reliability of the final result. Key risks concerning academic integrity include the presentation of text generated by artificial intelligence as the student's own independent work. the use of non-existent sources and incorrect bibliographic information; the inclusion of unverified facts and erroneous linguistic explanations in academic text; the student's avoidance of developing their own writing, analytical, and argumentation skills; the transmission of personal and confidential information to inappropriate platforms. UNESCO considers it essential to ensure data protection, human autonomy, and ethical governance principles when generative artificial intelligence is used in education. (Miao & Holmes, 2023). This perspective indicates that academic integrity is not limited solely to student behavior; it also encompasses the responsibility of educational institutions and instructors to establish clear guidelines. In the context of Azerbaijani language instruction, it is advisable to apply several principles to uphold academic integrity. The principle of transparency: Students must disclose the purpose for which artificial intelligence (AI) was used-for instance, its role in brainstorming ideas, checking grammar, or editing. The principle of authorship

responsibility: Students must bear responsibility for the content of the final text, the accuracy of the facts presented, and adherence to linguistic standards. The principle of source verification: References provided by AI must be cross-checked against original sources; any sources whose existence or content accuracy cannot be confirmed should not be included in the academic work. The principle of process-oriented assessment: Instructors may consider not only the final outcome but also initial drafts, editing history, student commentary, and oral explanations. The principle of equal opportunity. During assessment, students' access to technology, levels of digital literacy, and diverse learning needs should be taken into account.

Thus, academic integrity can be more effectively ensured not by a complete ban on technology, but by clarifying the purposes, boundaries, and accountability mechanisms regarding its use. In Azerbaijani higher education institutions, the use of generative artificial intelligence may impact the content, methods, and assessment mechanisms of language instruction. However, integrating this technology into the pedagogical process requires a systematic approach. First and foremost, it is essential to create banks of tasks designed to evaluate the quality of AI tools in the Azerbaijani language. These banks could include exercises focusing on orthography, morphology, syntax, lexico-semantics, and stylistics. By submitting the same prompts to various systems, one can compare the accuracy and consistency of the generated responses. A second key area is the development of digital and AI literacy among educators. Teachers must be able not only to use technical tools but also to evaluate the outputs, identify errors, and design tasks that align with specific teaching objectives. The third area of focus is the expansion of digital resources for the Azerbaijani language. Reliable electronic dictionaries, annotated text corpora, databases of normative grammatical information, and examples of academic writing can provide a vital foundation for verifying the outputs generated by artificial intelligence in language instruction. The fourth area involves the development of guidelines for academic integrity. Universities must define which types of assignments may involve the use of artificial intelligence, how such usage should be disclosed, and the criteria by which a student’s individual contribution will be evaluated. The fifth area concerns the conduct of empirical research. Comparing experimental and control groups within actual Azerbaijani language learning environments-through surveys of instructors and students, qualitative analysis of texts, and long-term observation-can help determine the actual impact of this technology. These directions could contribute to strengthening the position of the Azerbaijani language within digital learning environments and to developing language technologies tailored to the specific needs of the language. To provide a stronger empirical foundation for the article's scientific novelty, it would be appropriate to conduct a study examining the impact of AI-supported writing instruction in Azerbaijani language classes. The central research question could be formulated as follows: How does feedback supported by generative artificial intelligence affect the development of written language competence in Azerbaijani, compared to feedback provided by a teacher? The following hypotheses could be tested in the study: AI-supported feedback may assist in correcting grammatical and orthographic errors. AI-driven feedback, when combined with teacher supervision, may improve text structure and the quality of editing. The impact of using artificial intelligence on independent writing skills may depend on how the process is structured and the extent to which the learner approaches the feedback with a critical perspective. The research may incorporate initial and final writing tasks, assessment rubrics, student surveys, and an analysis of the editing process. Assessment criteria

could encompass grammatical accuracy, lexical diversity, textual coherence, argumentation, stylistic appropriateness, and independent editing skills. The number of participants, their educational level, the duration of the intervention, and the organization of groups must be determined in advance, and the results should be analyzed based on empirical data. Such research would make it possible to evaluate the extent to which general findings from international literature on Azerbaijani language instruction are applicable within the local linguistic and educational context.

Developing teachers' artificial intelligence literacy is a crucial prerequisite for this process. The UNESCO (2024) framework for AI competencies for teachers emphasizes the importance of using technology in a human-centered, ethical, and pedagogically sound manner. In line with this approach, methods such as project-based assignments, oral defenses, the comparison of initial and final drafts, and the step-by-step monitoring of the writing process can be employed.

Conclusion

The theoretical-conceptual analysis indicates that generative artificial intelligence creates new pedagogical opportunities to support the development of language competence in the teaching of the Azerbaijani language. These opportunities relate to the explanation of lexical and grammatical material, the improvement of written language, the creation of personalized tasks, the provision of formative feedback, and the development of critical thinking. However, the mere availability of the technology and its capacity to generate rapid responses do not, in themselves, guarantee effective learning. The primary theoretical finding of this research is that generative artificial intelligence in language instruction should not be viewed as an independent source of knowledge or a replacement for the teacher; rather, it should be considered a pedagogical support system—one that is guided by the teacher and operates through the active participation of the learner. The proposed “Teacher – Learner – Artificial Intelligence” model integrates the following stages: defining the initial language activity, automated feedback, critical review, independent editing, and reflective assessment. The agglutinative structure, morphological and syntactic norms, stylistic features, and national-cultural semantic layers of the Azerbaijani language necessitate a distinct linguistic evaluation of artificial intelligence tools. In this regard, assessing the quality of generative AI in the Azerbaijani language, expanding reliable digital language resources, and developing AI literacy among educators are identified as priority areas. Within the context of academic integrity, the core principle is not to prohibit the use of technology, but rather to ensure its application is transparent, responsible, and aligned with educational objectives. Preserving the learner's personal contribution, verifying sources, disclosing the use of technology, and assessing the learning process are the fundamental requirements of this approach. The theoretical novelty of this article lies in its integration of the pedagogical potential of generative artificial intelligence, the specific assessment needs for language instruction, and the principles of academic integrity into a unified conceptual framework. However, the practical effectiveness of the proposed model remains to be validated through empirical research. Future studies should focus on comparing the written output of students at various language proficiency levels, measuring the impact of feedback provided by artificial intelligence versus instructors, and evaluating the normative and semantic accuracy of texts generated in the Azerbaijani language. Thus, the integration of generative artificial intelligence into Azerbaijani language instruction requires aligning technological

innovation with pedagogical objectives. The long-term efficacy of this integration depends not only on leveraging the capabilities of the technology but also on safeguarding human capacities for independent thinking, linguistic choice, creative expression, and academic responsibility.

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