LEVERAGING ARTIFICIAL INTELLIGENCE FOR AUTOMATED CLINICAL CASE CREATION IN MEDICAL ENGLISH PEDAGOGY

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Abstract: The integration of artificial intelligence into Medical English education offers new methodological opportunities for developing students’ clinical, linguistic, and communicative competencies. A key innovation is the automatic generation of clinical cases, which enables the creation of adaptive, context-rich, and professionally relevant learning materials. AI-generated scenarios mirror authentic clinical situations, adjust to learners’ proficiency levels, and embed specialized terminology that supports the development of clinical reasoning in English. This approach enhances work with professional texts, strengthens problem-based learning, and provides a safe environment for practicing doctor–patient communication.

Keywords: *artificial intelligence; clinical case generation; Medical English; digital pedagogy; adaptive learning; professional communication*

Аннотация: Интеграция технологий искусственного интеллекта в обучение медицинскому английскому открывает новые методические возможности для формирования клинических, языковых и коммуникативных компетенций студентов. Одним из наиболее перспективных направлений является автоматическая генерация клинических кейсов, обеспечивающая создание адаптивных, содержательных и профессионально релевантных материалов. Кейсы, сформированные искусственным интеллектом, отражают реальные клинические ситуации, учитывают уровень подготовки обучающихся и включают специализированную терминологию, развивающую клиническое мышление на английском языке. Такой подход усиливает работу с профессиональными текстами, поддерживает проблемно-ориентированное обучение и моделирует коммуникацию «врач–пациент» в безопасных условиях.

Ключевые слова: *искусственный интеллект; генерация клинических кейсов; медицинский английский; цифровая педагогика; адаптивное обучение; профессиональная коммуникация*

Annotatsiya: Tibbiy ingliz tilini o‘qitishda sun’iy intellektni joriy etish talabalarning klinik, lingvistik va kommunikativ kompetensiyalarini rivojlantirishga xizmat qiluvchi yangi metodik imkoniyatlarni yaratadi. Ushbu jarayonning eng istiqbolli yo‘nalishi — klinik vaziyatlarning sun’iy intellekt yordamida avtomatik generatsiyasi bo‘lib, u moslashuvchan, mazmunli va kasbiy jihatdan dolzarb o‘quv materiallarini yaratishga imkon beradi. Sun’iy intellekt tomonidan shakllantirilgan klinik holatlar real tibbiy vaziyatlarni aks ettiradi, talaba tayyorgarlik darajasiga moslashadi va maxsus terminologiyani o‘z ichiga olgan holda ingliz tilida klinik tafakkurni rivojlantiradi.

Kalit so‘zlar: *sun’iy intellekt; klinik vaziyatlar generatsiyasi; tibbiy ingliz tili; raqamli pedagogika; moslashuvchan ta’lim; kasbiy kommunikatsiya*

The rapid development of digital technologies and the integration of artificial intelligence into higher medical education are reshaping the methodological foundations of teaching English for medical purposes. As English serves as the primary language of global professional communication, future healthcare specialists must be prepared for multilingual clinical

interaction. Traditional approaches based on static texts and limited simulations frequently do not reflect the complexity and immediacy of real medical work.

AI-driven technologies have introduced new possibilities for designing adaptive and professionally relevant learning environments. One of the most innovative directions is the automatic generation of clinical cases, which provides instructors with individualized, context-rich scenarios closely mirroring diagnostic, communicative, and reasoning tasks from authentic medical practice. Unlike conventional materials, AI-generated cases can vary in complexity, terminology, and communicative structure, thus enabling personalized instruction and creating conditions for developing linguistic and clinical thinking skills simultaneously.

Research into the pedagogical potential of AI in generating clinical cases is therefore timely and essential for modern Medical English education. These technologies strengthen the authenticity of materials and contribute to the development of key competencies—clinical reasoning, decision-making, and patient-centered communication performed in English as a working language.

Methodologically, this work relies on a conceptual and analytical framework rooted in competency-based language teaching, digital pedagogy, and professionally oriented instruction. The study includes theoretical analysis of AI tools capable of producing medical narratives and diagnostic scenarios; evaluation of pedagogical requirements for high-quality clinical cases; identification of didactic functions fulfilled by AI-generated materials; and formulation of criteria for integrating such cases into Medical English curricula. Content analysis and expert comparison are used to assess AI output against traditional teaching materials.

The analysis demonstrates that AI tools are capable of producing clinically coherent and terminologically accurate scenarios aligned with the communicative needs of medical students. These cases consistently include essential elements such as symptom description, patient history, diagnostic logic, and doctor–patient communication, making them appropriate for a wide range of language tasks.

A key advantage revealed through comparison with conventional textbook materials is the high degree of adaptability: AI allows rapid modification of case difficulty, vocabulary density, and communicative focus. This supports differentiated learning and enhances student engagement through personalized content. AI-generated cases also facilitate improved terminology acquisition, as terms appear in meaningful contexts within realistic clinical narratives, strengthening retention and correct usage.

Integrating AI-generated cases enriches established formats such as problem-based learning, role-play, case analysis, and guided discussion. Because AI can incorporate pharmacological, diagnostic, communicative, and ethical elements into a single case, the resulting materials promote interdisciplinary learning and more closely resemble real clinical tasks.

These findings illustrate the transformative methodological potential of AI-supported case generation. By shifting from static materials to flexible, customizable content, instructors gain the ability to align teaching resources more closely with professional competencies. AI-generated scenarios naturally combine terminology, communication practice, reading, and reasoning, increasing the didactic coherence of instructional materials and facilitating holistic learning.

The scalability of AI-generated content further expands the methodological toolkit of the instructor. The ability to instantly adjust case parameters—such as symptom severity or communicative load—enables tailored scaffolding and the development of vertically structured task sequences. Thus, AI functions not only as a linguistic resource but also as a facilitator of clinical thinking.

At the same time, the effective use of AI-generated content requires pedagogical oversight. Although AI can produce clinically plausible scenarios, inconsistencies may occur, especially in nuanced diagnostic or ethical contexts. Therefore, the instructor’s role evolves from material provider to methodological curator responsible for reviewing the accuracy, ethical soundness, and curricular relevance of AI output.

The broader implications of integrating AI into Medical English instruction highlight several key issues. First, AI enables unprecedented authenticity and situational diversity, overcoming the limitations of printed resources. Students can engage with rare or context-specific clinical situations that would otherwise be difficult to access in language classrooms. Second, AI supports personalized learning trajectories for students with diverse linguistic backgrounds, promoting equity and enhancing learning outcomes. Third, AI-generated cases strengthen the shift from language-centered to competency-based learning, integrating linguistic skills with clinical reasoning tasks.

Ethical considerations are also essential. The use of AI in medical education requires safeguarding against inaccuracies, ensuring that generated content corresponds to current clinical standards. Responsible integration demands digital literacy and critical evaluation on the part of the educator.

Overall, the examination of artificial intelligence as a tool for automatic clinical case generation demonstrates its substantial methodological value for Medical English education. Advanced language models provide educators with adaptive, terminologically rich, and clinically structured scenarios that can be efficiently incorporated into competency-based instruction. When used responsibly, AI-generated cases enhance authenticity, personalization, and interdisciplinary integration while expanding the possibilities for professional communication training in medical universities.

Thus, the adoption of AI-based tools represents a promising direction in the digital transformation of Medical English instruction. These technologies enrich the methodological repertoire of educators, increase student engagement, and better prepare future physicians for communication in international clinical environments.

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