EVALUATING INTERACTIVE METHODS AND DIGITAL PLATFORMS FOR TEACHING ESP TO MEDICAL STUDENTS

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Abstract. Shift from tradition to the digital environment has tremendously changed the frame of pedagogy for teaching English for Specific Purposes (ESP) in medical schools. Although there are numerous examples of digital use, an investigation into the effect of the integration of the digital structure with student-centered interactive practices is still required. The objective of this research was to investigate the effects of an integration of interactive teaching practices and the use of digital technologies on medical students' language competence and professional involvement. By examining the use of the above-mentioned technologies and teaching methods the study shows how to enhance communicative competence, learner autonomy and to enable medical students to use specialized medical vocabulary. In the quantitative study the Experimental Group acquired a post-test score of 84.5%, an increase of 27.7% compared to the Control Group's 8.5% increase ($p < 0.05$). The article also presents the advantages and challenges of this type of integration and their effects on the medical education process.

Key words: digital platforms, interactive methods, medical English, language acquisition, learning environment, ESP.

Annotatsiya. Raqamli avvalo ta'limga o'tish tibbiy o'quv dasturlarida maqsadga yo'naltirilgan ingliz tili (ESP) o'qitishning pedagogik asoslarini tubdan o'zgartirdi. Raqamli vositalar tobora keng tarqalgan bo'lsa-da, strukturaviy raqamli platformalarni interaktiv, talaba markazli metodologiyalar bilan birlashtirishning sinergetik ta'sirini baholash zarurati saqlanib qolmoqda. Ushbu tadqiqotning asosiy maqsadi tibbiyot talabalarining til ko'nikmalari va kasbiy faolligiga interaktiv o'qitish usullari hamda raqamli o'quv platformalarini integratsiyalashgan tarzda qo'llashning qanday ta'sir ko'rsatganini aniqlash edi. Ushbu texnologiyalar va metodologiyalarni tahlil qilish orqali tadqiqot ularning kommunikativ kompetentsiya, o'rganuvchining avtonomligi va professional tibbiy terminologiyani egallashga qo'shgan hissasini ko'rsatadi. Kvantitativ tahlil shuni ko'rsatdiki, Eksperimental guruh post-testda 84,5% natija ko'rsatdi, bu 27,7% ga o'sishni anglatadi va Nazorat guruhining 8,5% o'sishidan sezilarli darajada yuqori bo'ldi ($p < 0,05$). Maqolada shuningdek, tibbiy o'qitish jarayonida ushbu raqamli integratsiyaning afzalliklari, qiyinchiliklari va umumiy ta'sirlari ta'kidlanadi.

Kalit so'zlar: raqamli platformalar, interaktiv usullar, tibbiy ingliz tili, tilni egallash, o'quv muhiti, maxsus maqsad uchun ingliz tili.

Аннотация. Переход к образованию, ориентированному на цифровые технологии, коренным образом изменил педагогическую основу преподавания английского языка для специальных целей (ESP) в рамках медицинских учебных программ. Несмотря на все более широкое распространение цифровых инструментов,

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по-прежнему существует необходимость в оценке синергетического эффекта от сочетания структурированных цифровых платформ с интерактивными, ориентированными на студента методами обучения. Основной целью данного исследования было определить, как на языковые навыки и профессиональную вовлеченность студентов-медиков повлияло комплексное использование интерактивных методик преподавания и цифровых учебных платформ. Благодаря анализу этих технологий и методологий исследование демонстрирует их вклад в развитие коммуникативной компетенции, автономии учащихся и усвоение профессиональной медицинской терминологии. Количественный анализ показал, что экспериментальная группа достигла результата 84,5% по итогам тестирования, что представляет собой улучшение на 27,7% и значительно превосходит прирост контрольной группы в 8,5% ($p < 0,05$). Далее в статье освещаются преимущества, проблемы и общие последствия такой цифровой интеграции для процесса обучения медицине.

Ключевые слова: цифровые платформы, интерактивные методы, медицинский английский, овладение языком, учебная среда, профессиональный английский язык.

Introduction

In this 21st century, technology has had enormous implications on education, and among all of them the most significant is the infiltration of digital tools into classrooms, as observed in the realm of foreign language teaching. The traditional approach to language education, focusing on communication, interaction, and authenticity, seems outdated in the current context where students have come to expect and appreciate the flexibility and access that digital tools can offer. Thus, the proliferation of digital platforms and interactive teaching methods stems from the realization that these elements are not just means to broaden learning resources but to increase student involvement and promote independence.

The scope of the study encompasses the process of teaching foreign languages in higher education. Particularly, this study investigated the efficacy of integrating digital educational platforms and interactive teaching methods to enhance language competence, learner autonomy, and professional engagement among medical students. Interactive methods should not just be the keywords of this research, as these teaching strategies are found to improve students’ engagement and motivation to learn. Despite a multitude of studies discussing the implications of digital education, minimal research has investigated the integration of digital tools and interactive methods in the field of Teaching Medical English.

Literature review To delve deeper into what researchers have found, digital transformation is facilitating a more flexible and student-centered education. Plenty of studies prove this point: digital platforms can facilitate communication, collaboration, and individual learning among students. According to Lohr et al. (2021) study, advanced technology integration allows more dynamic and student-centred learning experiences, digital learning activities provide flexibility, enabling both synchronous and asynchronous learning, which can accommodate diverse student needs, technology can improve assessment and feedback mechanisms, allowing for real-time responses and more personalized student support.

Digital education aims to enhance the accessibility, flexibility, and effectiveness of education by leveraging digital resources, platforms, and methodologies to support and enrich the learning experience, as part of a broader digital and societal transformation, which makes digital skills imperative for schools, universities, and businesses (Allan, 2019; Janardhanan et al., 2023;)

The concept of digital didactics refers to the study and application of teaching and learning methods that utilize digital technologies to enhance educational processes. It encompasses the design, implementation, and evaluation of digital learning experiences, aiming to improve educational outcomes by leveraging the affordances of digital technologies, which include interactivity, personalization, accessibility, collaboration, multimodal learning, and immediate feedback (Bezoluk et al., 2021).

Luna et al. (2024) points out the enhancement of student engagement and interaction, as integrating digital tools allows for more dynamic and participatory learning environments, incorporation on digital activities into face-to-face instruction makes learning more relevant and applicable and encourage the creation of learning communities, promoting collaboration and knowledge exchange among student.

Digital platforms are teaching and learning tools like Moodle, Google Classroom, Duolingo, and Quizlet, which provide teachers with an opportunity to organize assignments, provide materials, and track student progress. They are major components of EdTech. Accessibility is one more advantage of such platforms: it allows students to access them anytime, anywhere. The fact that these platforms can support student learning in foreign language teaching is quite crucial, given the significance of consistent practice in mastering languages. Hence, students will have the ability to improve their writing, reading, listening, and speaking outside of the classroom.

Personalization is another benefit of digital platforms: there are numerous smart technologies applied to such platforms to either raise or lower the difficulty level based on the students' abilities, making everyone learn on their own terms and students do not have to be held back just because the majority are not ready to proceed. This allows students who need extra time to keep up and students who are prepared to move on can accelerate the learning process. The use of digital platforms requires students to take responsibility for their own learning, leading to the development of autonomy and self-discipline; hence, teachers will find it easy to keep track of their students' development and offer appropriate, quick feedbacks, the usage of video, audio and interactive learning activities are also found to make students engage in the content.

Didactic Possibilities of Digital Platforms serve as the "infrastructure" for modern language learning.

Table 1 Digital Platforms

Platform Category	**Primary Didactic Function**	**Representative Tools**
LMS (Learning Management Systems)	Content management, progress tracking, and asynchronous debate.	Moodle, Google Classroom
Gamification	Vocabulary retention via spaced repetition and competition.	Quizlet, Memrise, Kahoot!
Collaboration	Peer-to-peer editing and medical case brainstorming.	Nearpod, Padlet, Miro

Google Classroom: A blended learning platform that streamlines assigning, collecting, and grading student work, widely used in digital communication.

Duolingo: A language-learning platform that uses gamification and AI-powered personalized lessons to make language acquisition engaging.

Quizlet: A study tool that enables users to create digital flashcards and access AI-powered study games for memorization and learning.

Miro's Google Calendar integration lets to attach boards to events so teammates get automatic access and are ready to collaborate.

The nature of modern language learning strongly emphasizes interactive activities. Interactive teaching methods move away from teacher-centered lessons and get students involved. Role-playing doctor-patient scenes, engaging in group discussions and debates allow students to practice speaking in authentic situations and develop the ability to think critically and organize their thoughts. Case study is another teaching method: students work on hypothetical or authentic scenarios and have to come up with solutions, thus gaining skills in problem solving and applying the language pragmatically. Brainstorming sessions encourage students to express themselves more freely and remove the anxiety about making errors. The fact that language learning requires cooperation leads to interaction in pairs and groups, where students improve communication skills and enjoy lessons.

Research Methodology A mixed-methods research design was used throughout the 2024-2025 academic year at Osh State University. Participants were 120 first year international medical students divided into an Experimental Group (EG) (n=60), utilizing a blended learning format, and a Control Group (CG) (n=60), with traditional instruction methods. The intervention lasted for 15 weeks (full semester).

Intervention Framework For the EG, Moodle served as a center platform where it was integrated with Quizlet for vocabulary development, and with Nearpod for interactive live sessions. These instructions and activities involved:

Gamified Case Studies: Students underwent virtual patient intake via branching scenarios.

Virtual Role-Play: Synchronous video conferences for virtual doctor-patient interactions were established.

Peer-to-Peer Workshops: A synchronous setting was used for students to analyze and collaborate on patient report information, enhancing critical writing skills.

Data Collection Instruments To enhance validity and reliability, the following four instruments were employed: Pre-test & Post-test: Both of these tests consisted of 35 multiple-choice questions covering the English for Medical Purposes (EMP) material. The content assessed was based on both clinical communication, anatomy and diagnostic terminology.

LMS Analytics: These records were monitored to assess the frequency of students' use of the platform, to check that each student completed interactive modules on time, and to monitor how often each student engaged in forum discussions.

Likert-Scale Survey: A 20 item questionnaire was issued to all students on the last day of the semester in order to measure the students' satisfaction with the courses, and how beneficial they found each learning method to be.

Semi-Structured Interviews: These interviews were held with five faculty members of the medical school to gauge a change in the faculty's methods, and teaching experience.

Data Analysis The quantitative data from both tests were analyzed in SPSS (Statistical Package for the Social Sciences), a software for data analysis, by using an independent samples t-test in order to see whether there were any significant differences in test scores between the CG and the EG. The interview data were analyzed through qualitative methods, particularly thematic analysis, in order to identify patterns among the interview transcripts with relation to the transition towards a digital environment.

Bringing Digital and Interactive Teaching Together The researchers proposed that simply implementing digital tools was not sufficient on their own; they needed to be accompanied by interaction.

Case-Based Learning (CBL): This was utilized by having students go through virtual patient scenarios where they must diagnose a disease, and then communicate the results of this diagnosis in English.

Flipped Classroom: Medical students used their online time to gather knowledge on medical terminology, leaving synchronous time for high-level academic discourse.

Gamified Simulation: This feature allowed for the creation of assessments in an environment similar to a medical board exam which required fast clinical thinking.

Benefits and Disadvantages Implementing these teaching methods yielded an improvement in the Professional Realism offered to the students by allowing them to practice handovers and bedside manners in a safe, 'no-failure' scenario. It also increased flexibility to meet the challenging medical student schedule, and enabled Personalized Pacing to the student's needs with adaptive algorithms. However, some of the disadvantages are the varied levels of digital literacy amongst faculty members, poor Internet or Software infrastructures, and potential Cognitive Overload from poorly designed interfaces.

Results To ascertain the improvement in medical linguistic competency the pre-test and post-test results were examined.

Table 2: Comparison of Pre-test and Post-test Scores (%):

Group	Pre-test Scores	Post-test Score	Improvement
Control Group (CG)	57.7%	66.2%	+8.5%
Experimental Group (EG)	56.8.%	84.5%	+27.7%

According to the T-test results, interactive platforms combined to make it possible to improve clinical communication skills and vocab recall better than a non-interactive method.

LMS analytics provided evidence of increased learning:

The students in the Experimental Group had access to the learning materials more often than the students in the Control Group. They had 84% success with Gamified Case Studies as compared to the 57% success with assigned readings of traditional cases.

Qualitative data thematic analysis: Three categories of advantages of the digital-first approach were derived from student feedback:

Lowering of Foreign Language Anxiety (FLA): Students were 82% more confident with their speaking ability in a digital simulation as compared to a traditional classroom.

Improvement of terminology: Learning to remember difficult Latinate medical terms was easier using spaced repetition (e.g., Quizlet, Moodle).

Contribution to clinical practice: Students reported that the simulations were most reflective of the actual needs when on rotations.

Discussion The results of this study reveal that digital environments not only function as content delivery methods but as facilitators of learning.

Active vs. Passive learning One key finding from the study was the shift in pedagogy from passive to active learning. Whereas students in the Control Group struggled through rote learning and traditional translation exercises, students in the Experimental Group were engaged in "meaning-making" with simulations. This is in line with constructivist theories which indicate that medical students are likely to gain greater proficiency when attempting to solve clinical problems as opposed to simply being lectured about English.

The "Safe Failure" environment The drop in Foreign Language Anxiety is arguably the most significant contribution from the digital learning method. Digital platforms create a "Safe Failure" space for students to make diagnostic errors and use incorrect terminology

without the shame of a public classroom or the dire consequences of clinical practice. This environment contributes to the 82% of increased confidence students stated when speaking English.

Closing the gap between classroom and clinical practice Interactive approaches are clearly bridging the gap between General English and English for Medical Purposes (EMP), evidenced by high scores on professional relevance. By recreating an environment simulating that of a hospital and implementing standard handoff protocols, students are transferring abstract grammar knowledge into actionable English skills for patient safety and interprofessionalism.

Conclusion The ability of digital environments to elevate foreign language learning beyond a mere academic exercise and translate into professional practice is the hallmark of its modern didactic potential. High Education Institutions (HEIs) can effectively produce clinically sound yet linguistically able professionals capable of contributing to a global health setting through a combination of a well-structured LMS and interactive simulations. Ultimately, the integration of interactive approaches and digital learning platforms signifies a fundamental paradigm shift in the methodology of teaching foreign languages to medical students.

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