

INTEGRATIVE APPROACHES TO TEACHING PROFESSIONAL ENGLISH IN TECHNICAL UNIVERSITIES

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Abstract. This article explores integrative approaches to teaching professional English in technical universities. The study analyzes the effectiveness of content-based instruction, project-based learning, and digital technologies in developing students' professional communicative competence. Particular attention is paid to interdisciplinary interaction and multilingual competence within engineering education. The findings demonstrate that integrative methodologies significantly increase students' motivation, improve communication skills, and facilitate deeper understanding of technical concepts in multilingual learning environments.

Keywords: integrative approach, professional English, technical education, content-based instruction, project-based learning, multilingual competence, interdisciplinary learning.

Introduction

Modern technical higher education is undergoing substantial transformation under the influence of globalization, digitalization, and international academic integration. In Uzbekistan, current educational reforms aimed at establishing advanced engineering schools emphasize the preparation of highly qualified specialists capable of participating in global technological and scientific processes [2]. Under these conditions, English language instruction in technical universities must move beyond traditional language-centered paradigms and contribute to the formation of professional communicative competence required in multilingual engineering environments.

Traditional English for Specific Purposes (ESP) approaches often isolate language instruction from technical disciplines. As a result, students experience difficulties transferring linguistic knowledge to authentic professional situations. Such separation weakens the development of integrated communicative competence and reduces students' motivation to learn professional English.

This study examines integrative methodologies that combine language learning with technical content. Drawing on the experience of Andijan State Technical Institute, the article investigates how content-based instruction, project-based learning, and digital technologies can transform English language education into an interdisciplinary and professionally oriented process. Special attention is devoted to multilingual competence as an important resource for improving technical understanding and communication.

Literature Review

The theoretical foundation of integrative language teaching is closely connected with the concept of Content-Based Instruction (CBI), developed by Brinton, Snow, and Wesche (2003). According to this approach, language acquisition becomes more effective when instruction is organized around meaningful academic or professional content [3]. In technical education, CBI creates strong connections between English language learning and engineering disciplines, enabling students to acquire linguistic competence through authentic technical materials.

Another important methodological framework is Project-Based Learning (PBL), extensively discussed by Thomas (2000) and further developed by Beckett and Slater (2018). PBL promotes collaborative inquiry and problem-solving activities that simulate real professional situations. As Stoller (2006) notes, project-oriented instruction supports simultaneous development of language proficiency and professional knowledge.

The integration of digital technologies into language education has also received considerable scholarly attention. Warschauer and Kern (2000), as well as Chapelle (2021), emphasize that digital environments provide students with access to authentic professional discourse communities through online platforms, technical forums, video materials, and collaborative communication tools.

Recent studies on multilingual competence conducted by Cenoz and Gorter highlight the importance of holistic approaches that recognize the interconnected nature of languages within learners' linguistic repertoires. In technical universities, the strategic use of Uzbek and Russian alongside English may facilitate comprehension of complex technical concepts and contribute to cognitive flexibility.

Research conducted in the context of Uzbekistan also emphasizes the necessity of educational innovation and interdisciplinary integration. Abdullaeva and Khurana (2024) underline existing challenges in implementing innovative educational practices, while national educational policies increasingly support the integration of academic training with industrial and technological development [2; 5].

Research Methodology

The present qualitative action research was conducted over two academic semesters at Andijan State Technical Institute. The study involved students from the departments of Mechanical Engineering, Civil Engineering, and Information Technology.

The participants included 156 second-year students with English proficiency levels ranging from A2 to B2, as well as 12 instructors involved in interdisciplinary teaching activities.

The pedagogical intervention included interdisciplinary integration of technical and language content, project-based learning activities, technology-mediated instruction, and the use of multilingual learning strategies. Language instructors and engineering faculty collaboratively aligned English language instruction with technical subjects studied by students. Students participated in long-term professional projects devoted to sustainable engineering solutions, technical documentation development, and research proposal preparation.

Technology-mediated instruction involved the use of engineering YouTube channels, technical blogs, online articles, and professional forums. Students prepared analytical summaries, presentations, and reflective discussions based on authentic materials. The instructional process also incorporated the strategic use of Uzbek and Russian through comparative analysis, translation activities, and multilingual discussions aimed at facilitating technical comprehension.

Analysis and Results

The qualitative analysis revealed several important outcomes associated with the implementation of integrative methodologies.

First, students demonstrated significantly increased motivation toward learning professional English. Integrative approaches made language learning more meaningful and professionally relevant. Project activities enabled learners to connect English usage with their future engineering careers and professional interests. One mechanical engineering student noted that English was no longer perceived as an isolated academic subject but rather as a practical tool necessary for understanding international standards and communicating with engineers worldwide. Students with lower language proficiency also demonstrated reduced anxiety and became more actively involved in classroom interaction.

Second, multilingual engagement contributed to deeper conceptual understanding of technical subjects. The strategic use of Uzbek and Russian facilitated conceptual clarification, while English provided access to international professional terminology and scientific resources. Students reported that switching between languages improved comprehension of engineering concepts and enabled more effective interpretation of technical materials. Engineering instructors additionally observed stronger conceptual understanding among students participating in interdisciplinary activities.

Third, the intervention contributed to the development of integrated professional competence. Post-intervention assessment demonstrated improvements in academic writing, terminology usage, oral fluency, and presentation skills. Students became more confident in adapting communication strategies to different professional situations and audiences. The study also revealed the emergence of professional metacognitive skills associated with communicative flexibility, critical thinking, and collaborative problem-solving.

Despite these positive outcomes, several challenges were identified during implementation. Institutional barriers included limited interdisciplinary coordination and insufficient time for collaborative planning between language and engineering faculty members. Some engineering instructors initially perceived language education as secondary to technical training. Additional difficulties included varying levels of students' language proficiency and limited technological infrastructure, particularly unstable internet access and insufficient digital resources.

Discussion

The findings challenge traditional distinctions between language learning and content learning by demonstrating their interdependent nature within technical education. Language functions not merely as a tool for expressing knowledge but also as a medium for constructing professional understanding.

The study supports translanguaging perspectives according to which multilingual resources facilitate cognitive development rather than interfere with language acquisition [4; 7]. Technical concepts may therefore be more effectively understood through strategic movement across several languages.

Furthermore, project-based instruction proved particularly effective because it embedded language learning within authentic professional tasks and collaborative problem-solving activities. Such an approach corresponds with situated learning theory, emphasizing learning through meaningful participation in professional practices.

Future research should investigate the long-term effects of integrative methodologies, compare different models of interdisciplinary instruction, and explore technology-enhanced language learning in resource-constrained educational contexts.

Conclusion

Integrative approaches to teaching professional English in technical universities demonstrate substantial potential for improving both language proficiency and professional competence. By combining language instruction with engineering content, applying project-based methodologies, integrating digital technologies, and utilizing students' multilingual resources, educators can better prepare future engineers for participation in international professional environments.

Technical university curricula should therefore promote genuine interdisciplinary collaboration between language and engineering departments. Faculty development programs should support cooperative instructional practices, while institutional policies should recognize the strategic importance of interdisciplinary language education.

Ultimately, the objective extends beyond teaching English as a foreign language. The broader goal is the formation of professionally competent engineers capable of effective communication, international cooperation, and active participation in global technological development.

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