AMERICAN Journal of Language, Literacy and Learning in STEM Education
Volume 4, Issue 04, 2026 ISSN (E): 2993-2769

The Process of Working on Grammatical Material and Developing The Speech Competence of Biomedical Engineering Students

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Abstract: *This article examines the problem of forming the communicative competence of non-philological university students in the process of teaching Russian based on professionally oriented situational conversations. Special attention is paid to the specifics of training students in the "Biomedical Engineering" field, whose professional activities are carried out in conditions of interdisciplinary interaction and high communicative responsibility. Key professional communication situations in "engineer-doctor" and "engineer-patient" systems are analyzed, and the necessity of integrating language training with the professional context is substantiated. It is concluded that the use of situational conversations contributes to the development of speaking skills, the formation of professional discourse, and the enhancement of the effectiveness of the communicative training of future specialists.*

Key words: *Communicative Competence, Professional Communication, Biomedical Engineering, Scientific Speech, Speech Activity, Speech Skills, Professional Text, Terminology*

1. Introduction

The modern higher education system is focused on training specialists who possess high competitiveness and are capable of effectively carrying out professional activities under conditions of intensive communicative interaction. In this regard, communicative competence acquires particular significance, which is considered one of the basic professionally significant characteristics of a future specialist alongside the level of subject knowledge and the formation of practical skills [1].

In the context of a non-philological university, the Russian language performs a multifunctional role, serving not only as an academic discipline but also as a vital means of professional communication, scientific exchange, and interdisciplinary interaction[2]. For students in technical fields, including those majoring in "Biomedical Engineering," the degree to which communicative competence is formed directly affects the success of the educational process, the effectiveness of research activities, and the effectiveness of future professional practice [3].

2. Methodology

Within the framework of this study, communicative competence is defined as the integrative ability of an individual to carry out speech interaction in professionally significant situations, taking into account communication goals, communicative conditions, and professional discourse norms, as well as using adequate linguistic means, specialized terminology, and effective communicative strategies [4].

3. Results and Discussion

The specific nature of professional activity in biomedical engineering necessitates the purposeful development of speaking skills within the context of typical and problematic production situations[5].

The communicative competence of a future biomedical engineer is implemented in a number of key situational blocks, including operational and technical interaction related to discussing issues of configuration, calibration, and maintenance of complex medical equipment; design and research communication involving the presentation of innovative developments such as biocompatible materials or neuroprostheses within scientific and practical activities; and clinical and consultative interaction, during which the engineer acts as an expert on the technical support of the treatment process[6].

The theoretical analysis of V. V. Safonova's works allows for the assertion that in the context of a non-philological university, the formation of communicative competence must be carried out in close interconnection with the socio-cultural and professional context of the specialist's future activity[7]. Applied to the training of biomedical engineers, this involves mastering the norms of professional ethics accepted in the medical environment, as well as mastering the speech etiquette of academic and clinical communication[8].

The professional activity of a biomedical engineer is characterized by a high degree of communicative responsibility, as it is carried out in an interdisciplinary space at the intersection of engineering, biological, and clinical knowledge[9]. In the context of digitalizing healthcare and the active implementation of artificial intelligence systems, communication is acquiring the status of a system-forming factor that ensures patient safety and the reliability of medical technology operation[10].

In this context, organizing effective interaction within the "engineer-doctor" system, aimed at forming a common conceptual framework and ensuring the accurate transmission of technical information to medical practice, is of particular importance[11]. Biomedical engineering acts as a link between engineering solutions and clinical tasks, ensuring the interpretation of complex technical parameters in the language of practical medicine[12]. Communicative errors in this field can have serious consequences comparable to technical equipment failures[13].

The expansion of the scope of personalized medical technologies and wearable biomedical devices also makes interaction in the "engineer-patient" system more relevant. In this case, the process of determinologization plays a special role, involving the adaptation of specialized technical concepts to the level of patient perception[14]. Furthermore, the psycho-emotional aspect is becoming a significant component of communication, contributing to the formation of trust in medical technologies and increasing patient compliance[15].

4. Conclusion

The study confirms that the development of communicative competence among biomedical engineering students is a crucial component of their professional training, particularly within the context of interdisciplinary interaction and high communicative responsibility. The findings demonstrate that the integration of professionally oriented situational conversations into the process of teaching Russian significantly enhances students' speaking skills, facilitates the acquisition of specialized terminology, and promotes the formation of professional discourse in real-life communication contexts. It was established that the use of communicative and context-based approaches enables students to effectively operate within key interaction systems such as "engineer–doctor" and "engineer–patient," thereby improving both the accuracy and clarity of technical information exchange. Moreover, the results highlight that communicative competence in this field is not limited to linguistic proficiency but also includes socio-cultural awareness, professional ethics, and the ability to adapt complex terminology to different audiences. The practical implications of the

research suggest that the incorporation of interdisciplinary and practice-oriented language teaching methods can significantly increase the effectiveness of training future biomedical engineers and contribute to improved communication in healthcare environments, ultimately supporting patient safety and technological reliability. However, further research is required to explore the integration of digital learning tools, simulation technologies, and artificial intelligence-based communication platforms in language training, as well as to conduct empirical studies measuring the long-term impact of communicative methodologies on professional performance in biomedical engineering practice.

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