



**METHODOLOGY OF TEACHING ENGLISH TO STUDENTS OF THE
“MECHATRONICS AND ROBOTICS” PROGRAM**

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A B S T R A C T	K E Y W O R D S
<p>This article examines the methodological features of teaching English to students enrolled in the “Mechatronics and Robotics” program within the context of modern technical education. The relevance of the study is determined by the increasing role of English as a tool for professional communication, access to international scientific resources, and enhancement of the competitiveness of future engineering specialists. The study aims to identify the most effective methodological approaches to teaching English to students of technical specialties while considering the specific characteristics of their professional training. The paper analyzes contemporary educational technologies focused on developing professional communicative competence, integrating subject content with language instruction, and increasing students’ motivation. The findings indicate that the implementation of the communicative approach, Content and Language Integrated Learning (CLIL), project-based learning, professionally oriented tasks, and digital educational resources contributes to improving students’ language proficiency and developing professional communication skills.</p>	<p>Teaching methodology, English language, mechatronics, robotics, professionally oriented instruction, CLIL, communicative approach, technical education, language competence, engineering education</p>

INTRODUCTION

The current stage of engineering education development is characterized by the active integration of professional training into the international educational, scientific, and technological environment. Under these conditions, English language proficiency has become an essential component of professional competence for specialists in the field of Mechatronics and Robotics.

The development of automation technologies, robotic systems, intelligent control, and digital manufacturing requires future engineers to be capable of working with technical documentation, participating in international projects, analyzing scientific publications, and carrying out professional communication in English.

However, teaching practice demonstrates that traditional foreign language teaching methods do not always ensure the development of professionally oriented communicative skills among students of technical specialties. Among the major challenges are varying levels of students’ language

proficiency, limited classroom hours, insufficient integration of language content with professional disciplines, and low motivation to use English in professional contexts.

The relevance of this research is determined by the necessity to develop and implement effective methodological solutions that ensure integration between language and professional training.

The aim of the study is to determine effective methodological approaches to teaching English to students of the “Mechatronics and Robotics” program.

Research objectives:

1. To examine contemporary approaches to teaching English to students of technical specialties.
2. To identify specific characteristics of teaching students majoring in Mechatronics and Robotics.
3. To analyze the effectiveness of professionally oriented teaching methods.
4. To develop recommendations for improving the educational process.

MATERIALS AND METHODS

The methodological framework of the study was based on a combination of modern pedagogical and linguodidactic approaches.

The theoretical component included the analysis of scientific literature on foreign language teaching methodology, English for Specific Purposes (ESP), Content and Language Integrated Learning (CLIL), communicative language teaching, and digital pedagogy.

The empirical component was based on pedagogical observation, analysis of students’ learning activities, and generalization of practical experience in teaching English to students of technical specialties.

The following research methods were employed:

- analysis of scientific and methodological literature;
- pedagogical observation;
- comparative analysis of teaching approaches;
- analysis of educational outcomes;
- generalization of pedagogical experience.

Special attention was paid to examining the effectiveness of integrating professional terminology, project-based assignments, technical case studies, authentic materials, and digital educational platforms.

The study was conducted in three stages: preparatory (review of theoretical foundations), analytical (selection and evaluation of methodological technologies), and interpretative (generalization of results and formulation of recommendations).

During English language instruction for students of the Mechatronics and Robotics program, professionally oriented tasks simulating real engineering situations were applied.

Examples of instructional tasks:

1. Technical Vocabulary Tasks

Students were required to study and apply professional terminology related to the following topics:

- robotic systems;
- automation technologies;
- sensors and actuators;

- programmable controllers;
- industrial equipment;
- artificial intelligence in robotics.

Example task:

Match the technical terms with their definitions and use them in sentences describing a robotic production line.

2. Technical Reading and Speaking

Students worked with English-language technical materials and delivered oral explanations.

Example task:

Read the text “Components of a Mechatronic System” and explain the operating principle of the system in English.

Implementation stages:

- reading the text;
- identifying technical terminology;
- preparing an oral explanation;
- participating in group discussion.

3. Project-Based Learning

Students completed mini-projects related to professional topics.

Example project:

Designing a Smart Robotic Arm

Project stages:

- defining the purpose of the device;
- describing the structure;
- preparing a technical presentation;
- presenting the project in English.

4. Case Study Method

Students were provided with practical engineering problems.

Example case:

A manufacturing robot stopped functioning due to sensor failure. Discuss possible solutions and present recommendations in English.

Objectives:

- development of professional speaking skills;
- application of technical terminology;
- formation of teamwork skills.

RESULTS

The conducted study demonstrated that the most effective approaches for teaching students of the Mechatronics and Robotics program are methods oriented toward professional communication.

It was found that CLIL technology contributes to the simultaneous development of language and professional competencies through the integration of subject-specific content into English language instruction.

The implementation of project-based learning increased students' independence and improved their ability to solve professional problems using a foreign language.

Positive outcomes were also observed through technical text analysis, simulation of professional situations, oral presentations, group projects, and work with professional terminology.

As a result of implementing practice-oriented tasks, the following changes were identified:

- increased student participation during speaking activities;
- greater use of professional terminology;
- improved comprehension of technical texts;
- enhanced readiness for professional communication.

For example, during the project "Smart Factory Automation," students demonstrated the ability to:

- describe technical processes in English;
- justify engineering decisions;
- use professional vocabulary in oral communication.

Overall, the results revealed increased student engagement, stronger motivation for learning English, and improved professional interaction skills.

DISCUSSION

The obtained findings confirm the necessity of moving from traditional language instruction toward an integrated learning model focused on professional objectives.

For students of the Mechatronics and Robotics program, English language learning becomes more effective when instructional content is directly connected with future professional activity.

The integration of digital technologies, engineering case studies, teamwork, and authentic materials creates favorable conditions for developing sustainable professional communicative competence.

Particular importance should be attached to creating an educational environment in which English functions not as the ultimate goal of instruction but as a tool for solving professional tasks.

The findings demonstrated that incorporating professional context increases students' motivation in technical education.

Tasks such as:

- Explain how a robotic manipulator works;
- Describe the operation of a sensor system;
- Present your automation project;
- Discuss advantages and limitations of industrial robots the transition from mechanical language acquisition to practical language application in professional contexts.

The combination of:

English + Technical Content + Communication Practice proved especially effective and corresponds to contemporary principles of ESP and CLIL instruction.

CONCLUSION

The conducted study made it possible to conclude that the effectiveness of teaching English to students of the Mechatronics and Robotics program depends on the degree of integration between language instruction and professional content.

The most effective methodological solutions include the communicative approach, CLIL technology, project-based learning, the use of digital educational resources, and practice-oriented assignments.

The practical significance of the study lies in the possibility of applying the proposed recommendations within higher technical education to improve professionally oriented English language instruction.

Prospects for further research are associated with developing digital learning models and implementing adaptive educational technologies for engineering specialist training.

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