



DEVELOPING TERMINOLOGICAL COMPETENCE THROUGH INTERACTIVE LEARNING

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| Article history: | Abstract: |
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| <p>Received: 14th April, 2026 Accepted: 11th May 2026</p> | <p>Terminological competence plays an important role in the professional training of engineering students. This study explores the potential of interactive learning technologies for developing terminological competence in technical higher education. The research is presented as a case study of the teaching resource <i>Professional Russian Language: From Term to Specialist's Speech</i>, designed for students of Metallurgical Engineering and Metal Technology. The analysis shows that collaborative learning, professional simulations, visual resources, and problem-based discussions promote the active use of professional terminology and support its integration into professional communication. The findings suggest that interactive learning contributes to the development of students' ability to use specialised vocabulary in professional contexts.</p> |

Keywords: terminological competence, interactive learning, engineering education, professional communication, Russian language teaching, technical terminology, case study

1. INTRODUCTION

Terminological competence is increasingly regarded as an essential component of professional training in engineering education, as it enables students to understand, interpret, and use disciplinary concepts in professional communication [1, 2]. Modern engineers are expected not only to possess technical knowledge but also to communicate effectively within professional communities, analyse technological processes, and explain technical decisions using appropriate disciplinary language.

Despite the growing importance of professional language training, terminology instruction in technical universities is often limited to the memorisation of definitions and the completion of reproductive exercises. Such approaches contribute to the recognition of terms but do not necessarily ensure their active and contextually appropriate use in professional communication. As a result, students frequently experience difficulties when applying specialised vocabulary in discussions, presentations, and problem-solving situations related to their future profession.

Interactive learning technologies offer an alternative approach by placing students in situations that require the active use of professional terminology. Interactive learning is based on collaboration, communication, and problem-solving activities that encourage students to employ specialised vocabulary as a practical instrument of professional interaction rather than as isolated lexical material [3, 4].

From the perspective of communicative language teaching, professional terminology should be acquired through meaningful language use rather than through mechanical memorisation of definitions [5, 6]. This approach is particularly relevant in technical higher education, where language and professional knowledge are closely interconnected.

The purpose of this study is to examine the potential of interactive learning technologies for the development of terminological competence among technical university students through a case study of the teaching resource *Professional Russian Language: From Term to Specialist's Speech* [7].

2. METHODS

This research was conducted as a case study. The object of analysis was the teaching resource *Professional Russian Language: From Term to Specialist's Speech*, developed for students of Metallurgical Engineering and Metal Technology programmes [7]. The study focused on the interactive learning technologies embedded in the structure of the resource and their contribution to terminological competence development.

The methodological framework combined analysis of pedagogical and methodological literature, content analysis of the teaching resource, and pedagogical modelling [3, 4]. The analysis aimed to identify the forms of interactive learning incorporated into the instructional materials, the ways in which professional terminology is introduced and practised, and the mechanisms that support the transition from terminology recognition to active professional use.

Particular attention was paid to the relationship between language activities and professional content, as well as to the extent to which the learning tasks simulate authentic engineering communication.

To verify these observations empirically, the content analysis was complemented by a pedagogical experiment. The experiment involved 40 first-year students of the Metal Technology programme at Andijan State Technical Institute, all of whom were studying Russian as a non-native language. The study was conducted over one semester of the 2024–2025 academic year and comprised three stages: a baseline (diagnostic) stage, a formative stage, and a control stage.

At the baseline stage, the initial level of students’ terminological competence was diagnosed, and the participants were divided into a control group (20 students) and an experimental group (20 students). At the formative stage, the experimental group received instruction built around a set of interactive technologies, including the case method, problem-based learning, pair and small-group work, business and role-play simulations, visualisation techniques, and digital multimedia platforms. The control group continued to be taught primarily through traditional explanatory-reproductive methods.

The methodological basis of the experiment was a three-component model of terminological competence comprising a subject-cognitive component, a communicative-speech component, and an intellectual-reflexive component. Each component was assessed through a corresponding set of diagnostic tasks: tests on knowledge of terms and definitions for the subject-cognitive component; oral responses, professional dialogues, and case-based assignments for the communicative-speech component; and the analysis and correction of terminological errors for the intellectual-reflexive component.

Throughout the experiment, students worked with professionally oriented tasks drawn from metallurgy and metal technology. In a typical case assignment, students were asked to explain how a change in tool heat resistance, resulting from replacing carbon tool steels with hard alloys, affects cutting speed, processing productivity, and production cost, using terms such as “heat resistance,” “tool wear,” “cutting speed,” “productivity,” “hard alloy,” and “production cost.” To develop the intellectual-reflexive component, students were given statements containing deliberate terminological errors – for example, the claim that ferrite is the hardest and most brittle phase of iron-carbon alloys – and asked to identify the error and justify the actual difference between the properties of ferrite and cementite. Quantitative and qualitative analysis was used to compare the indicators of the control and experimental groups before and after the experiment.

3. RESULTS

The analysis revealed that the development of terminological competence within the teaching resource is based on the systematic integration of interactive learning activities into professionally oriented language instruction. The structure of the material supports a gradual progression from the comprehension of technical terms to their active application in professional communication.

3.1. Baseline level of terminological competence

The results of the baseline stage showed that most students in both groups had a low or intermediate level of terminological competence. Students experienced difficulties in using professional terminology independently, in explaining terms in their own words, in applying terminology in professional situations, and in establishing logical and semantic connections between concepts. The most frequent errors were the confusion of the concepts of “hardness” and “strength,” the incorrect use of the terms “ferrite” and “cementite,” and the substitution of professional terms with general vocabulary. The distribution of students by level of terminological competence at the baseline stage is shown in Table 1.

Table 1. Baseline level of students’ terminological competence

| Level | Control group | Experimental group |
|--------------|---------------|--------------------|
| High | 12% | 13% |
| Intermediate | 46% | 45% |
| Low | 42% | 42% |

These data indicate that there were no significant differences between the two groups at the initial stage of the experiment.

3.2. Implementation of interactive technologies in the experimental group

One of the key elements identified in the resource is collaborative learning. Students are required to analyse technical texts, discuss professional concepts, and solve engineering-related tasks in groups. Such activities increase the frequency and variety of terminological usage and encourage students to explain specialised concepts to their peers. This corresponds to contemporary views on collaborative learning as a means of developing communicative and professional competences [3, 4].

The analysis also demonstrated the significant role of professional simulations. Many tasks are organised around production-related situations that require students to analyse technological processes, identify causes of technical problems, and propose solutions. In these activities, terminology serves as an essential means of professional reasoning and communication. Students use technical vocabulary to describe phenomena, justify decisions, and explain engineering processes.

Another important component of the resource is the use of multimedia and visual learning materials. Diagrams, technological schemes, illustrations, and graphical representations facilitate the comprehension of complex technical concepts and strengthen the connection between terms and the phenomena they denote. Visual support is particularly valuable when students encounter abstract engineering concepts that cannot be easily understood through verbal explanation alone [4].

The study further identified the use of problem-based discussion activities. Students are required to analyse professional situations, evaluate alternative solutions, and formulate arguments using specialised vocabulary. Such tasks encourage the production of extended professional discourse and support the development of analytical and communicative skills alongside terminological competence [5].

3.3. Outcomes of the control stage

At the control stage, repeated diagnostics were carried out using tasks equivalent in content and difficulty to those used at the baseline stage. The results showed a marked improvement in the experimental group, whereas the changes in the control group were comparatively modest. The comparative distribution of students by level of terminological competence after the experiment is presented in Table 2.

Table 2. Level of students' terminological competence after the experiment

| Level | Control group | Experimental group |
|--------------|---------------|--------------------|
| High | 20% | 45% |
| Intermediate | 50% | 50% |
| Low | 30% | 5% |

In the experimental group, the proportion of students at the high level increased from 13% to 45%, while the proportion at the low level decreased from 42% to 5%. In the control group, the corresponding changes were considerably smaller: the high level grew from 12% to 20%, and the low level decreased from 42% to 30%. The difference between the groups was statistically significant (χ^2 test, $p < 0.05$), which confirms that the gains observed in the experimental group can reasonably be attributed to the interactive technologies applied during the formative stage rather than to natural development over the course of the semester.

Qualitative observation further showed that students in the experimental group demonstrated greater confidence in using terminology in spontaneous professional speech, made fewer substitutions of professional terms with general vocabulary, and were more successful in identifying and correcting terminological errors in the intellectual-reflexive tasks. Students also reported higher motivation to participate in classroom discussion when tasks were organised around case studies and role-play simulations rather than purely receptive exercises.

The findings indicate that the resource treats terminology not as an isolated linguistic phenomenon but as an integral component of professional communication and professional thinking.

4. DISCUSSION

The results of the study demonstrate that interactive learning technologies create favourable conditions for the development of terminological competence in technical higher education. The identified approaches support active engagement with professional vocabulary and encourage students to apply terminology in meaningful communicative situations.

A notable feature of the analysed resource is its close connection with the students' professional field. Terminological instruction is embedded within the context of metallurgy and metal technologies, allowing language learning and disciplinary learning to reinforce one another. This integration contributes to a deeper understanding of technical concepts and facilitates the transfer of terminology into active professional use.

The formative stage revealed a number of difficulties. Many students avoided using terms in spontaneous speech, replacing them with descriptive paraphrases. In reflexive tasks, participants struggled to identify terminological errors, which indicated gaps in their systematised knowledge. Some students found case studies and role-play simulations challenging due to insufficient technical background. This necessitates the gradual introduction of interactive tasks after the consolidation of basic concepts, along with continuous corrective feedback.

The findings support the view that terminological competence extends beyond knowledge of definitions. Effective professional communication requires the ability to use terminology appropriately in analytical, explanatory, and argumentative discourse [1, 2]. Interactive learning technologies provide opportunities for such language use and therefore contribute to the formation of functional professional competence.

The study also highlights the importance of authentic professional contexts. When terminology is presented through realistic engineering tasks and production scenarios, students are more likely to perceive specialised vocabulary as a practical instrument of future professional activity rather than as a purely academic requirement. This observation is consistent with the principles of communicative and professionally oriented language education [5, 6].

5. CONCLUSION

This case study examined the role of interactive learning technologies in the development of terminological competence among technical university students. The analysis of the teaching resource *Professional Russian Language: From Term to Specialist's Speech* revealed the systematic use of collaborative learning, professional simulations, multimedia resources, and problem-based discussions as instruments for developing professional vocabulary.

The findings suggest that interactive learning technologies facilitate the transition from passive recognition of technical terms to their active and contextually appropriate use in professional communication. Terminology becomes integrated into students' professional reasoning, enabling them to analyse engineering problems, discuss technological processes, and communicate specialised knowledge effectively.

The study confirms that professionally oriented interactive instruction can serve as an effective framework for the development of terminological competence in technical higher education and may be considered an important component of contemporary engineering language education.

REFERENCES

1. Leontiev, A. A. *Language, Speech, and Speech Activity in General and Educational Linguistics*. Moscow: Moscow Psychological and Social Institute, 2003.
2. Zimnyaya, I. A. *Psychology of Teaching a Non-Native Language*. Moscow: Russkiy Yazyk, 1989.
3. Polat, E. S. (Ed.). *New Pedagogical and Information Technologies in Education*. Moscow: Akademiya, 2001.
4. Selevko, G. K. *Modern Educational Technologies*. Moscow: Narodnoye Obrazovanie, 1998.
5. Passov, E. I. *Communicative Method of Teaching Foreign-Language Speaking*. Moscow: Prosveshchenie, 1989.
6. Azimov, E. G., Shchukin, A. N. *New Dictionary of Methodological Terms and Concepts (Theory and Practice of Language Teaching)*. Moscow: IKAR, 2009.
7. Aripova, S. A. *Professional Russian Language: From Term to the Specialist's Speech*. Andijan: Omadbek Print Number One LLC, 2026. 228 p.
8. Khakimova, Sh. R. Development of Professionally Oriented Oral Speech of Students in Russian Language Classes at a Non-Linguistic University. *Economy and Society*, 2023, no. 5-1 (108), pp. 450–453.
9. Kulibina, N. V. Information and Communication Technologies in Teaching Russian as a Non-Native/Foreign Language: New Formats. *Pedagogical Education in Russia*, 2023, no. 2, pp. 115–122.
10. Arynbayeva, R. A., Dmitryuk, N. V., Stycheva, O. A. Basic Values in Teaching Russian: Psycholinguistic Aspects. *Journal of Language and Linguistic Studies*, 2022, vol. 18, no. 1, pp. 333–344.