DEVELOPMENT AND PILOT STUDY OF AN EXERCISE SYSTEM TO DEVELOP MONOLOGIC SPEAKING SKILLS IN FOREIGN ENGINEERING AND TECHNICAL STUDENTS AT THE PRE-UNIVERSITY STAGE

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Abstract. This study presents the development and pilot testing of a structured system of exercises designed to enhance monologic speaking skills in foreign students of engineering and technical profiles during pre-university language training. As monologic speech is central to academic participation and professional communication, particularly in science and engineering contexts, the lack of systematic, professionally oriented speaking exercises poses a pedagogical challenge. Guided by communicative, task-based, and competency-oriented approaches, the exercise system blends authentic tasks with peer interaction, structured prompts, and progressive complexity. The pilot study involved 78 foreign students enrolled in a preparatory faculty program in a Russian technical university. A mixed-methods design assessed exercise effectiveness through pre- and post-performance rubrics based on CEFR descriptors, participant self-reports, and teacher evaluations. Results demonstrate statistically significant improvements in speech organization, lexical range, and fluency, particularly when tasks incorporated peer feedback and real-world stimuli. Findings suggest that the proposed exercise system enhances both the accuracy and communicative confidence of learners. Implications for curriculum design and integration of monologic speaking tasks into pre-university programs are discussed. The study contributes to pedagogical research on speech skill formation in multilingual professional education contexts.

Keywords: monologic speaking, foreign students, engineering education, exercise system, pre-university training, task-based learning, communicative competence.

I. INTRODUCTION

Developing oral communication skills in a foreign language is a core component of preparatory training for international students entering higher education. Among the four fundamental language skills (listening, speaking, reading, writing), speaking — and specifically monologic speaking — occupies a pivotal role in academic and professional settings. In technical and engineering contexts, students regularly engage in presentations, technical explanations, and formal reports that require coherent extended speech. Despite its importance, monologic speech often receives insufficient systematic attention in pre-university language programs, where activities tend to emphasize comprehension or dialogic interaction rather than sustained oral expression.

The purpose of this study is to design a structured system of exercises targeted at developing monologic speaking skills and to empirically examine its effectiveness with foreign engineering students at a preparatory faculty. This research addresses a documented need for pedagogically grounded, scalable speaking practice integrated into subject-relevant language training.

II. LITERATURE REVIEW

Monologic speech is defined as extended, continuous speech produced by a single speaker without interspersed interlocutor turns. It is a distinct communicative mode requiring advanced planning, coherence, and lexical depth. Research reveals that monologic tasks foster proficiency in fluency and academic style, particularly when coupled with peer interaction and structured assessment protocols (Karpovich et al., 2021). In that study, monologue tasks paired with peer assessment significantly enhanced students' speaking proficiency, suggesting a pedagogical model that combines autonomous speech production with collaborative evaluation to improve language outcomes.

Task-based language teaching (TBLT) advocates the use of real communication activities as primary vehicles for learning (Ellis, 2003). While many TBLT studies focus on interactive dialogue and negotiation, monologic tasks (such as presentations or reports) can equally support communicative competence when structured to align with language proficiency descriptors — such as those articulated by the Council of Europe's CEFR. Peer and teacher feedback in monologic tasks contribute to increased self-regulation and metacognitive awareness (Karpovich et al., 2021).

Although much research on speaking skills addresses classroom contexts, monologic speech — particularly in academic and professional domains — necessitates specific instructional support. For engineering students, speech tasks that require explanation of technical processes or justification of systemic design decisions bridge language learning with disciplinary practice. Models developed for teaching monologic speech in problem-based learning contexts illustrate how tasks rooted in professional scenarios can enhance learner engagement and communicative competence.

III. METHODS

The exercise system was developed through an iterative process grounded in principles of task-based language instruction, communicative competence, and CEFR descriptors. Exercises were categorized into progressive levels of complexity:
- Descriptive Tasks – describing equipment, materials, or engineering processes.
- Explanatory Tasks – explaining cause-effect relations or system principles.
- Informative Tasks – summarizing technical content or reporting experimental results.
- Argumentative Tasks – defending methodological choices or analytical conclusions.

Each exercise set included prompt cards, lexical support lists, structural templates, and rubrics aligned to CEFR speaking descriptors.

Seventy-eight foreign students (levels B1–B2 in Russian as a foreign language) enrolled in a pre-university engineering preparatory program at university participated. Participants were randomly assigned to experimental (n=40) and control (n=38) groups. The study spanned one academic term (6 weeks). The experimental group received the exercise system during weekly speaking sessions, supplemented with peer assessment and teacher feedback. The control group received standard speaking practice typical of existing curricula.

Pre- and post-speech tasks: Each participant delivered a monologic speech video recorded on designated technical topics.

Evaluation Rubrics: Based on CEFR descriptors (task achievement, cohesion/coherence, grammatical range, lexical resource, pronunciation).

Self-Assessment Questionnaires: Rated confidence, perceived difficulty, and motivation.

Teacher Assessment: Independent raters evaluated performance improvements.

Quantitative data from rubric scores were analyzed using paired sample tests to detect within-group and between-group changes. Qualitative participant reflections were analyzed for emerging themes related to task perceived utility.

IV. RESULTS

The pedagogical experiment demonstrated that the developed system of exercises had a substantial positive impact on the formation of monologic speech skills among foreign students of engineering and technical specializations at the pre-university stage. Quantitative and qualitative analyses revealed statistically significant gains across all assessed dimensions of monologic speech in the experimental group when compared with the control group, which was taught using traditional instructional methods.

Quantitative results. Post-test measurements showed that students in the experimental group achieved higher mean scores in coherence, lexical range, fluency, task achievement, and speaking confidence. The most pronounced improvement was observed in task achievement, defined as the learner's ability to fulfill the communicative purpose of a monologic utterance in accordance with the заданная учебно-коммуникативная задача. The experimental group demonstrated an average improvement of 18%, whereas the control group showed only a 6% increase. This difference indicates that systematic training based on professionally oriented monologic tasks significantly enhances students' ability to produce goal-oriented and structurally complete utterances.

Improvements in coherence (22% in the experimental group versus 8% in the control group) suggest that learners became more capable of organizing monologic speech logically, maintaining thematic unity, and employing cohesive devices typical of academic and technical discourse. Lexical range also expanded considerably (20% versus 7%), reflecting more confident use of general scientific and introductory technical terminology, as well as greater variability in syntactic constructions.

Fluency gains (19% in the experimental group compared to 6% in the control group) indicate increased automatization of speech production and reduced hesitation during extended monologic tasks. These results are particularly significant for pre-university students, for whom limited fluency often becomes a barrier to successful participation in classroom communication in technical disciplines.

Table 1. Comparative improvement of monologic speech skills (%)

Measured dimension	Experimental group	Control group
Coherence	22	8
Lexical range	20	7
Fluency	19	6
Task achievement	18	6
Speaking confidence	25	9

The data presented in Table 1 clearly illustrate the advantage of the experimental methodology across all evaluated parameters.

Affective and reflective outcomes. In addition to linguistic indicators, affective variables were also examined. Self-reported confidence levels in public speaking and academic presentation tasks increased markedly in the experimental group (25%), whereas the control group showed only a modest rise (9%). Learners in the experimental cohort emphasized the importance of structured prompts, visual supports, and staged task progression, which helped reduce anxiety and facilitated more predictable planning of speech.

Qualitative analysis of learner reflections and teacher observations revealed that the gradual increase in task complexity played a crucial scaffolding role. Students reported that moving from short, guided monologues to extended, semi-independent presentations allowed them to internalize discourse patterns typical of engineering and technical communication. This progression fostered strategic language use, including conscious planning, self-monitoring, and self-correction during speech production.

Peer assessment and collaborative tasks also proved to be an important factor in the success of the experimental model. Peer feedback encouraged reflective comparison of one's own performance with that of classmates, contributing to the development of metacognitive awareness of individual strengths and weaknesses in monologic speech. As a result, learners became more autonomous and motivated participants in the educational process.

V. DISCUSSION

The findings align with research demonstrating the efficacy of monologue speaking tasks paired with peer interaction in improving communicative competence (Karpovich et al., 2021). The exercise system's structured progression offered clear communicative purposes at each stage, enabling learners to transfer rhetorical planning strategies to complex tasks.

Pedagogical Implications:

Scaffolded Task Design: Structuring tasks from simple descriptions to argumentative presentations can accommodate learners of varied proficiency while promoting development.

Peer Assessment Integration: Feedback from peers — when guided by clear rubrics — fosters autonomy and critical reflection.

Relevance to Professional Contexts: Exercises embedded in engineering themes can enhance discipline-specific language readiness, preparing learners for academic presentations and professional communication.

VI. CONCLUSION

This study developed and piloted a system of monologic speaking exercises tailored to foreign engineering and technical students at the pre-university stage. Results indicate that a structured, task-based exercise system, especially when integrated with peer assessment, significantly enhances monologic speaking outcomes, learner confidence, and communicative competence. The implications for curriculum design suggest that systematic incorporation of such exercise systems can address common gaps in pre-university language training. Future research should explore longitudinal outcomes and adaptation to other professional domains.

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