

Lexical Approach and Terminology in Developing Professional Competence: A Case Study in Ukrainian Higher Education

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Abstract

The aim of this research is to identify patterns of influence of terminological vocabulary and lexical approach on the formation of professional competence of students majoring in economics, military, and engineering, focusing on the effectiveness of various models of working with the terminological system in the educational process. To analyze the impact of terminology and lexical approach on the development of students' professional competence in higher education, six hypotheses were put forward. The study was conducted using a mixed methodology that combined quantitative and qualitative approaches. The quantitative component was aimed at measuring the level of mastery of terminological vocabulary and the dynamics of the development of students' professional competence, using a terminology test, a diagnostic questionnaire, and reflective tasks. The results of the study showed a significant difference in the dynamics of terminological competence development between the control and experimental groups. The control group showed a moderate increase in terminological competence (12%), while the experimental group showed an increase of 28%, which indicates the effectiveness of the lexical approach in learning. Moreover, economic and engineering students demonstrated greater flexibility, while military students need additional practical tasks and simulations for the effective formation of sociolinguistic competence. In addition, the experiment showed that the use of terminological vocabulary increased students' interest in learning. Finally, the results indicate that the introduction of terminological contributes to the improvement of communicative and professional competence, stimulates motivation to learn, develops critical thinking and adaptability to new contexts, and increases the overall effectiveness of education.

Keywords: foreign languages, higher education, lexical approach, professional competence, terminology

1. Introduction

Under globalization and digitalization, terminology has become central to higher education curricula, enabling students to acquire and apply specialized knowledge (Amelina, 2014). In non-English-speaking countries such as Ukraine, this trend highlights systemic challenges linked to higher education reform. European integration and alignment with the the European Higher Education Area (EHEA), increased the demand for graduates who can work professionally in their native language and communicate effectively in English. This is particularly crucial for students in economics, engineering, and military fields, whose careers involve transnational cooperation, international research, and global markets.

Despite the formal inclusion of ESP courses in Ukrainian higher education, studies reveal a persistent gap between declared language standards and students' actual professional use of English, particularly in terminological accuracy and contextual relevance (Holinyati, 2023). National standards prioritize general language competence, leaving professional and terminological skills underdeveloped. Consequently, graduates struggle with specialized reading, international collaboration, academic publishing, and professional communication beyond the national context. This problem is acute in economics, engineering, and military education, where students must use standardized terminology, technical documentation, and English-based international communication. As a result, general English proficiency does not guarantee professional communicative competence in these fields.

Therefore, systematic mastery of terminology is essential for developing professional competence, enhancing the global competitiveness of Ukrainian higher education, and improving graduates' international positioning. However, the role of terminological vocabulary and the impact of the lexical approach on professional English acquisition remain insufficiently explored in Ukrainian and European contexts. As a result, non-linguistic students often achieve general language proficiency without the ability to appropriately select and apply specialized terminology in professional communication. Terms belong to the lexical level of language and serve to denote concepts within specific scientific and technical fields. The lexical approach supports the development of students' critical and analytical thinking, as the ability to analyze and interpret information through specialized terminology is a key component of professional competence and effective problem-solving (Nahaieva, 2020).

Scientific terminology comprises terms denoting clearly defined concepts in science, technology, art, and public life (Bihych, 2006) and serves to structure knowledge and relationships between objects. Because knowledge is systemic, terminology reflects the organized system of concepts and is more systematic than other vocabulary. This systematicity arises from the dual nature of terms: they are conceptually embedded yet governed by linguistic laws. The logical organization of concepts enables clear differentiation of subject areas within a field of knowledge (Kocherha & Piletskyi, 2013).

Therefore, terminology formation prioritizes structural and cognitive aspects while also functioning as a unit of specialized communication. Scientific and technical terminology is characterized by structural-cognitive features, reflecting conceptual relations within a field, and pragmatic features, ensuring professional communication. Accordingly, terminological competence is the ability to use technical terms accurately and appropriately in professional contexts, including constructing grammatically correct statements and engaging in dialogue based on disciplinary training (Ohar, 2009).

Based on observations of students' learning activities, scholars identify creativity, terminological knowledge, cognitive skills, and motivation as key criteria for forming graduates' terminological competence (Dzhul & Zimenkovskiy, 2007). In this study, linguistic competence is understood as an integrated set of knowledge, skills, and abilities realized in communication and adapted to specific communicative demands (Kucheruk, 2018). By contrast, lexical competence refers to the ability to interpret contextual word meaning, establish cross-linguistic correspondences between English and Ukrainian, and use vocabulary appropriately in context (Zimmerman & Moylan, 2009). The person-oriented approach promotes student interaction, accounts for individual learning styles, and creates favorable conditions for personal development, emphasizing progress relative to the learner's previous level (Bihych, 2006). The integrative approach supports the simultaneous development of foreign-language knowledge, skills, and competencies, while the competence-based approach focuses on forming key competencies shaped by future professional activity and sociocultural context (Nikolaieva, 2019).

Upon entering higher education, students possess general English language knowledge from secondary school, including stress, spelling, syntax, and style. During their specialty training, they encounter profession-specific language through reading literature, writing essays, and preparing for practical classes using specialized terminology (Leshchenko et al., 2017). Professional language competence thus relies on mastery of the terminological system of the field (Vakulenko, 2015). However, in engineering and military education, the grammar-translation approach predominates, limiting the development of professional communicative competence (Vlasiyk, 2021). This study addresses this gap by experimentally testing targeted terminology training using the lexical approach.

Thus, the aim of the research is to identify patterns of influence of terminological vocabulary and lexical approach on the formation of professional competence of students majoring in economics, military, and engineering, focusing on the effectiveness of various models of working with the terminological system in the educational process. Accordingly, the research objectives are as follows:

- to analyze the role of terminological vocabulary within the lexical approach in developing professional foreign language competence of non-linguistic students;
- to evaluate the effectiveness of the lexical approach in improving students' terminological and professional communicative competence empirically;
- to compare the outcomes of implementing the lexical approach across different fields of study (economics, engineering, and military) and formulate practical recommendations for higher education.

The research aim and objectives stipulate the following research hypotheses:

- Hypothesis 1: the use of terminological vocabulary and lexical approach affects the development of students' professional competence significantly in higher education.
- Hypothesis 2: the influence of terminological vocabulary on the development of professional competence depends on the specialty.
- Hypothesis 3: there is an interdependence between the assimilation level of terminological vocabulary and the

students' motivation.

- Hypothesis 4: there is not always an interdependence between the application of the lexical approach and the level of students' general linguistic competence.
- Hypothesis 5: the use of the lexical approach facilitates the development of students' critical thinking in the professional field, which is manifested in their ability to interpret, adapt and apply professional terminology in non-standard and problematic contexts.

Students' written responses were assessed using criteria such as correct use of terminology, contextual appropriateness, ability to apply terms in new professional situations, and logical justification of professional decisions. These criteria revealed analytical and interpretive linguistic behavior, serving as an indicator of critical thinking in the professional domain. The study's novelty lies in empirically examining how systematic work with terminological vocabulary, via the lexical approach, contributes to the development of professional communicative competence in non-linguistic higher education.

2. Literature Review

Developing the professional competence of graduates is a central goal of contemporary higher education, reflected in Ukraine's national standards and the National Qualifications Framework, which emphasize a competency-based approach and readiness for international professional activity (Ministry of Education and Science of Ukraine, 2021). Terminological vocabulary and the lexical approach are key in this context. The lexical approach enhances linguistic competence, supporting effective communication (Isakova, 2017), while systematic study of terminology underpins professional communication across fields (Koval, 2013). Mastery of professional terms enables graduates to perform duties effectively and remain competitive in the labor market (Vlasiyk, 2021).

In vocational higher education programs, particularly in economics, engineering, and military fields, students are expected to use discipline-specific vocabulary actively, alongside relevant language knowledge, conversational skills, and professional competencies (Ackermann & Chen, 2013). Professional competence encompasses not only subject knowledge but also the ability to interact, exchange information, and make decisions collaboratively (Nattinger & DeCarrio, 2016). The lexical approach, emphasizing active use of terminology, supports the development of interpersonal communication and professional discussion skills essential for successful integration into the professional environment (Bareggi, 2013). According to Bareggi (2013), lexical competence comprises motivational, practical, cognitive, and reflective components. A student's ability to acquire and use foreign vocabulary depends on their skill in addressing challenges in learning new words, shaped by their prior knowledge and related abilities.

The lexical approach emphasizes vocabulary acquisition, enabling students to apply professional terms in practical contexts and enhancing adaptability, analysis, and critical thinking (Palasiuk & Kolodnytska, 2020). Borodina and Kaleniuk (2015) note that it improves professional language assimilation, forming the foundation of speech competence and supporting effective communication in real professional situations. Coxhead (2014) emphasizes that correct use of professional terminology helps graduates adapt to industry challenges, particularly in fields like engineering, economics, military, and tourism. He also highlights the importance of mastering general academic vocabulary to support interdisciplinary communication (Coxhead, 2025). Zimmerman and Moylan (2009) note that the lexical approach enhances cognitive competence through systematic assimilation of terms and concepts, better preparing students for real professional conditions.

While focusing on terminology can enhance students' professional communicative competence and readiness for global contexts, the lexical approach has limitations. Wen and Rosli (2023) note its potential reductionism, as it may not fully develop grammatical or discourse skills, and its effectiveness depends on learner characteristics, tasks, and context. Studies comparing lexical instruction with task-based and communicative approaches show that, although lexical teaching improves phrase recognition and memorization, task-based methods better support authentic communication (Borodina & Kaleniuk, 2015). Thus, the lexical approach is valuable for professional vocabulary acquisition but should be integrated into a broader pedagogical framework, with further research needed on its optimal use.

3. Method

3.1 Research Procedure

The study employed a mixed-methods design, combining quantitative and qualitative approaches. Quantitative analysis measured students' mastery of terminological vocabulary and the development of professional competence, while qualitative analysis assessed the effectiveness of the lexical approach. The study used training programs, terminology dictionaries, and educational platforms to implement the lexical approach in the learning process.

A total of 120 second- and third-year students majoring in economics (n=40), military (n=40), and engineering (n=40) from Lviv Polytechnic National University and Hetman Petro Sahaidachny National Army Academy took part in the experiment. The participants were aged between 18 and 22. Participants were selected using a stratified purposive

sampling procedure to ensure proportional representation of students majoring in economics, engineering, and military studies. The students were recruited from unchanged academic groups at the respective institutions, which could lead to some selection bias, as random assignment at the institutional level was not possible due to administrative and curricular constraints. The sample was drawn using a purposive stratified approach: students were deliberately selected from economics, engineering, and military programs to ensure representation of three different profiles of professional training. This targeting strategy was chosen to allow for comparative analysis by specialization rather than to achieve statistical representativeness of the entire student population.

The study lasted 4 months throughout the fall semester of 2024. Students were divided into two groups. The experimental ($n=60$) and control ($n=60$) groups were formed at the level of regular academic classes. Within each major (economics, engineering, and military), existing student groups were assigned to either the experimental or control group, using a simple randomization procedure (coin flip conducted by an independent faculty administrator who was not involved in the teaching or data analysis).

Students were informed about the study's objectives, data collection, confidentiality measures, and their right to withdraw without academic consequences. Researchers' dual role as teachers may have influenced engagement and self-reports; to reduce bias, testing instruments were standardized, reflective tasks anonymized, and statistical analyses conducted objectively. Nevertheless, results should be interpreted cautiously due to the non-randomized design and contextual factors. Participation was voluntary, with all students providing informed consent for the use of anonymized data, including test scores, questionnaires, observations, and written reflections. The study adhered to academic ethical standards. Participants were informed of the objectives and assured anonymity, with data used solely for academic purposes. Ethical approval was granted by the university's academic integrity committee.

3.2 Data Collection Methods

Data were collected using three methods, including a terminology test assessing students' ability to recognize, understand, and apply specialized vocabulary in a professional context. The test included 25 tasks across three levels: (1) term recognition through multiple-choice questions matching English terms with Ukrainian equivalents or definitions; (2) contextual use, requiring students to fill in missing terms in sentences; and (3) open-ended tasks, where students defined terms or used them in professionally oriented statements. Test items were standardized in format, number, and difficulty for all specializations, with content adapted to each field. The initial set of test items was developed by the authors based on an analysis of curricula and professional documentation for specific disciplines. To reduce the bias, the items were reviewed, revised, and approved by a group of three independent experts (two teachers of English as a foreign language and one specialist in the relevant professional field). Only those items that achieved full agreement were included in the final version of the test. At the second level, the ability to use the term correctly in context was tested: students were given sentences with a missing word, which had to be filled in with the appropriate term. The third level included open-ended tasks in which students had to formulate a definition of the term or apply it in their own example of a professionally oriented statement.

The reliability of this method was confirmed by internal consistency. Thus, the calculated Cronbach's alpha coefficient was 0.83, indicating a high level of reliability. Content validity was ensured through expert review by three experts: two ESP teachers and one subject matter expert from a relevant professional field. All of the experts were external to the teaching teams involved in the experiment and were not directly involved in the implementation of the study. Although they were professionally familiar with the authors as members of the same academic community, they were not involved in data collection, training, or analysis. The peer review was voluntary and unpaid, and experts were asked to assess the relevance, clarity, and professional adequacy of the test items using predefined criteria. The authors acknowledge the possibility of contextual familiarity; however, steps were taken to minimize bias by requiring full agreement among all experts on the inclusion of items.

The test was conducted in two formats. At the beginning of the semester, students took it as an entrance test to diagnose their basic level of terminology proficiency. At the end of the semester, the same test was used again to determine the dynamics of changes after completing the course. Thus, the test performed diagnostic and final control functions to assess changes in students' terminological competence during the semester. The effectiveness of the lexical approach was determined on the basis of a controlled instructional design in which the experimental and control groups followed predefined and standardized teaching models. To reduce variability in teaching, the same teachers taught both the experimental and control groups within each specialization. All teachers had comparable ESP qualifications and followed a common curriculum. The experimental group used a structured lexical approach, including work with terminology clusters, phrases, and contextualized professional discourse, while the control group followed a grammar and translation-based curriculum. The implementation of the classroom activities was monitored through structured observation checklists completed by two independent teachers who were not involved in the study design or data analysis. The study did not seek to isolate the effects of individual teacher characteristics or technology use; these factors are recognized as contextual variables and are considered limitations.

Moreover, a diagnostic questionnaire was created to study students' attitudes toward the use of terminological vocabulary and the lexical approach in the process of learning professional English. The questionnaire consisted of twenty-four statements based on a five-point Likert scale, where "1" corresponded to categorical disagreement and "5" to complete agreement on the part of the respondent. The main sections of the questionnaire covered the following criteria: motivational (interest in studying disciplines), cognitive (awareness of the importance of terminology), behavioral (willingness to apply terms in practical tasks), and emotional (feeling of confidence when using terminology). Owing to this structure, it was possible to record not only the level of students' objective knowledge, but also their subjective assessments, motivation, and individual perception of the learning process.

The questionnaire covered three main sections. The first one was aimed at identifying students' self-assessment of their knowledge of professional terminology. The second section concerned the assessment of the difficulties encountered by students in mastering terminology and the expected results of further training. Individual questions facilitated determining the extent to which respondents felt that their professional communicative competence had improved through the systematic use of vocabulary in thematic clusters. The questionnaire was developed after a multi-stage validation process. First, its content validity was established through peer review by three independent experts: an English teacher, an education specialist, and a practicing translator. These experts were not involved in the design of the experiment, data collection, or analysis, and were distinct from the experts who checked the terminology test to reduce potential overlap and bias. Based on expert feedback, the wording of several items was refined to remove ambiguities and improve clarity. The revised version of the questionnaire was then tested in a pilot study with a small group of students ($n=5$). According to the results of internal consistency testing, the instrument demonstrated a high level of reliability (Cronbach's $\alpha=0.86$).

The questionnaire was developed and refined before the main study during the pilot phase. After an expert review of the content, a preliminary version of the instrument was administered to a pilot group of students ($n=25$) who were not included in the main sample. The pilot study was intended to assess item clarity, wording, and internal consistency rather than to test research hypotheses. Based on the feedback from the pilot study, several items were revised: ambiguous wording was simplified, overlapping statements were merged, and items with negative wording were reworded to reduce respondent confusion. No items were added or deleted after the pilot phase. The data from the pilot study was used solely to improve the instrument and was not included in the final analysis. The pilot study was not designed as an independent empirical study and had not been published before.

In the main study, the final version of the questionnaire was administered in two stages. At the beginning of the academic semester, it was used to assess students' initial awareness of the role of terminology in professional communication. At the end of the course, the questionnaire was re-applied to identify changes in students' attitudes and evaluate the effectiveness of teaching methods. Thus, the questionnaire functioned as a tool for analyzing subjective factors influencing the acquisition of terminology and the development of professional competence. Students' written assignments were evaluated by two independent experts with experience in ESP and professional discussion. To ensure objectivity, the assessors used a single grading system, and any differences in grades were resolved through discussion. Inter-rater agreement was reached before the final analysis of the results. Quantitative measures of students' ability to apply terminology in new contexts were complemented by a qualitative thematic analysis of written responses, which allowed us to identify patterns of analytical thinking, flexibility of lexical use, and depth of professional interpretation.

In this study, critical thinking was operationalized as students' ability to analyze professional situations, interpret specialized terminology, and apply lexical items appropriately in changed or non-standard professional contexts. Instead of assessing critical thinking as a general cognitive trait, it was considered within the framework of professional communication competence and terminology use. The development of critical thinking was assessed through problem-based and reflective writing tasks in which students had to apply professional terminology beyond the definitions they had learned. These tasks included interpreting professional scenarios, adapting terms to new contextual conditions, and justifying lexical choices in written discourse related to their future professional activities.

In addition, reflective tasks were introduced as a qualitative research tool to identify the level of integration of terminological vocabulary into students' speech and assess the development of their professional communicative competence. They made it possible to track the dynamics of terminology acquisition in written practice and encouraged students to reflect on their own language strategies and ways of working with vocabulary critically. Each student had to prepare a written text of 150 to 200 words, discussing a certain problematic issue related to their future professional activity. The issues were selected based on the students' specializations. Thus, engineering students had to provide a description of technological processes or characteristics of technical equipment; economics students were asked to analyze business cases, and military academy students had to describe tactical situations and weapons. The main condition was the mandatory use of a certain number of professional terms studied during the semester.

3.3 Data Analysis Methods

The collected data were subjected to a multi-level analysis using quantitative and qualitative methods. Quantitative analysis was aimed at identifying changes in the acquisition of terminological vocabulary and the development of professional competence among students in the control and experimental groups.

Therefore, descriptive statistics were used: mean values, standard deviations, and ranges of indicators were calculated to identify general trends in the dynamics of results. To verify the statistical significance of the differences between the initial and final indicators, a paired sample t-test was used. To compare the mean values in the control and experimental groups, an independent samples t-test was used, which helped to evaluate the difference between teaching based on the grammar-translation-oriented traditional method and teaching based on the lexical approach.

In addition, the analysis of variance (ANOVA) was used for a more in-depth intergroup analysis. It was applied to assess the impact of two factors on the results of terminology acquisition: the type of training (traditional approach or lexical) and the students' specialization (engineering, economics, military). The use of one-factor and two-factor ANOVA determined whether there was an interaction between the chosen methodology and the students' training profile and identified which group showed statistically significant better results. Consent was obtained from teachers to participate in the development of the study's curriculum. The results were presented in a way that excludes the identification of individual teachers and cannot be used for evaluation or administrative purposes. Furthermore, to test the hypothesis regarding the relationship between the level of terminology vocabulary acquisition and the overall communicative competence of students, Pearson's correlation analysis was used. It permitted to determine the strength and direction of the relationship between key variables.

Qualitative data obtained from written reflective assignments were analyzed using thematic coding. First, students' texts were segmented into semantic blocks, which were coded according to the correctness, relevance, and stylistic integration of terminology into professional discourse. In the second stage of the analysis, recurring themes, strategies, and typical difficulties in the use of terms were identified. The qualitative results obtained were compared with quantitative indicators in order to specify the impact of the lexical approach on the formation of students' professional competence. All statistical calculations were performed using IBM SPSS Statistics 26 software. The level of statistical significance was set at $p < 0.05$, which ensured a high degree of reliability in the interpretation of the results.

4. Results

The study assessed the effectiveness of integrating terminological vocabulary for students in economics, military, and engineering programs. A pretest/posttest design compared an experimental group (lexical approach) with a control group (grammar-translation approach) using the same standardized terminology test. Results confirmed that systematic use of terminological vocabulary enhances students' professional competence (Table 1).

Table 1. The effects of lexical approach on students' professional competence

Group	Specialty	Before experiment, %	the After experiment, %	the Growth, %
Control (traditional approach)	Engineering	54	66	+12
Experimental (lexical approach)	Engineering	54	76	+22
Control (traditional approach)	Economics	58	70	+12
Experimental (lexical approach)	Economics	58	79	+21
Control (traditional approach)	Military	49	61	+12
Experimental (lexical approach)	Military	49	73	+24

The test results demonstrate positive dynamics in all three groups. The number of correct answers of engineering students increased from 54% to 76%. Economics students demonstrated an increase from 58% to 79%, while for military students the number of correct answers grew from 49% to 73%. The largest relative increase (+24%) was recorded in military students, which is associated with a low initial level and a high concentration on the training material during the experiment. The highest absolute result after the experiment was observed among economics students (79%), which indicates this group's high receptivity to the systematization of terminology.

To test the second hypothesis, intergroup analysis (ANOVA) revealed significant differences between economics and military students ($p < 0.05$), with moderate differences between technical and military groups. Comparative analysis showed that economics students consistently outperformed others in terminology competence and motivation. In the experimental group, economics students improved by 21% on the terminology test versus 12% in the control group, while military students improved by 24% versus 12%. Despite these gains, military students' absolute post-test scores remained significantly lower than those of economics students ($p < 0.05$), reflecting discipline-specific characteristics of professional discourse rather than teacher-related factors. These results confirm that the effectiveness of terminology training depends on the professional specialization.

The third hypothesis was tested using a questionnaire with 10 Likert-scale items on interest in learning and readiness to apply terms. Students in the experimental group showed a significant increase in motivation across all majors, while the control group, taught via the grammar-translation method, showed only minor gains. The largest increase was observed among economics students (+1.2), highlighting the link between terminological competence and intrinsic motivation. Overall, the results indicate that systematic, practical engagement with terminology through the lexical approach fosters higher motivation than traditional methods (Table 2).

Table 2. Interdependence between the assimilation of terminological vocabulary and students' motivation

Specialty	Before the experiment, %	After the experiment, %	Growth, %
Engineering	3,1	4,2	+1,1
Economics	3,3	4,5	+1,2
Military	2,9	3,9	+1,0

To test the fourth hypothesis, a detailed analysis of students' written work completed before and after the experiment was carried out. The analysis focused on the number of adequately used professional terms, their contextual relevance and accuracy. In the experimental group, which was taught using the lexical approach, the average number of adequately used terms by engineering students increased from 12 to 16 (+33%), by economics students from 10 to 14 (+40%), and by military students from 8 to 10 (+25%). In contrast, students in the control group, who were taught using the traditional grammar and translation method with limited emphasis on terminology practice, showed more modest gains: from 12 to 13 (+8%) among engineering students, from 11 to 12 (+9%) among economics students, and from 8 to 9 (+12%) among military students. A comparison of the written work completed at the beginning and end of the course revealed positive dynamics in both groups. However, the experimental group demonstrated a more significant increase in the number of professional lexical items used, a greater reduction in the incorrect use of terminology, and a more coherent integration of terms into professional discourse. These results indicated that while general linguistic competence could be developed in traditional teaching, systematic work with terminology in a lexical approach was necessary for improvements in professionally oriented written communication.

During the four-month intervention, the teaching methods in each group remained stable: there was no shift from the traditional method to the lexical approach, and no hybrid teaching models were introduced. Thus, the observed differences reflect the comparative impact of the two different teaching approaches rather than adaptive methodological changes (Table 3).

Table 3. The influence of the lexical approach on general linguistic competence

Specialty	Before the experiment, %	After the experiment, %	Growth, %
Engineering	12	16	+33
Economics	10	14	+40
Military	8	10	+25

To test the fifth hypothesis, students completed tasks requiring the application of terms in novel professional contexts. Post-experiment, 68% of economics students, 62% of technical students, and 49% of military students applied terms correctly. These results indicate a positive impact on critical thinking, though military students' performance remained below average, highlighting the need to tailor methods to discipline-specific discourse. Thus, the hypothesis is partially confirmed: the lexical approach fosters critical thinking, but its effectiveness depends on the specialty and professional context (Table 4).

Table 4. The impact of lexical approach on the development of students' critical thinking in the professional sphere

Specialty	Before the experiment, %	After the experiment, %	Growth, %
Engineering	52	62	+10
Economics	58	68	+10
Military	40	49	+9

The data indicate that integrating terminological vocabulary into the educational process positively impacts students' communicative and professional competence, motivation, and critical thinking (Table 5). Effectiveness was highest among economics students, moderate among engineering students, and lowest among military students, highlighting the need for a differentiated, discipline-specific approach. The results also underscore the value of combining terminological competence with practical and interdisciplinary tasks to support knowledge integration and critical thinking development.

Table 5. Summary of results

Indicator	Control group	Experimental group	Dynamics
Teaching method	Grammar-translation	Lexical approach	-
Increase in terminological competence	+12%	+28%	+16%
Improving the quality of written works	+15%	+32%	+17%
Increase in learning motivation	+8%	+21%	
Students' positive perception	41%	73%	+32%

Notes: The control group did not use the lexical approach during the intervention. Thus, the indicator “positive perception of the teaching method” in the control group reflects students’ assessment of traditional grammar and translation teaching, while in the experimental group it refers to the lexical approach.

Moreover, the results of the study showed a significant difference in the dynamics of terminological competence development between the control and experimental groups. The control group showed a moderate increase in terminological competence (12%), while the experimental group showed an increase of 28%, which indicates the effectiveness of the lexical approach in learning. The analysis of written assignments showed a similar trend: the quality of task performance, assessed according to the criteria of correct use of terms and accuracy of wording, increased by 15% in the control group and by 32% in the experimental group. A survey of students confirmed the positive perception of the lexical approach. Thus, 73% of the participants in the experimental group evaluated the convenience and effectiveness of the lexical approach used in the course positively. In contrast, 41% of students in the control group reported a positive perception of the traditional method of grammatical translation. The statistical analysis of the data showed a significant difference between the groups ($p < 0.05$), confirming the reliability of the results.

The results confirmed the first hypothesis: systematic use of terminological vocabulary via the lexical approach enhances students’ professional communication across specialties. Progress in written work and questionnaire analysis also partially confirmed the second hypothesis, showing that the approach supports critical analysis of professional texts and more effective terminology learning. Overall, the proposed model is an effective tool for developing the professional competence of future specialists.

5. Discussion

5.1 Impact of the Lexical Approach on Students’ Competence

The results confirmed all hypotheses, showing that terminological vocabulary enhances students’ professional competence, consistent with Redko (2012) and Bareggi (2013), who emphasize its role in accurate and adequate professional communication. Although all groups engaged in professionally oriented and interdisciplinary tasks, economics students showed the greatest progress, suggesting discipline-specific factors influenced outcomes. Lower gains among military students may reflect the high standardization of military terminology and the structured nature of professional discourse, which, despite being considered in task design, limit lexical variation and contextual flexibility. This highlights the need to adapt methodologies to the specifics of each professional environment for maximum effectiveness.

The lexical approach enhanced general linguistic competence, as shown by a greater increase in correctly used professional terms in the experimental group compared to the control group taught via the grammar-translation method. Students learned to adapt terms to context, improving interpersonal communication and understanding of professional discourse, consistent with Isakova (2017). Economics and engineering students demonstrated greater flexibility, while military students require additional practical tasks and simulations to effectively develop sociolinguistic competence.

The experiment showed that using terminological vocabulary increased students’ motivation, with average gains of 1–1.2 points in the experimental group, confirming the lexical approach’s positive impact on engagement and independent learning (Bareggi, 2013). The largest increase occurred among economics students. Since all cohorts completed standardized tasks assessed by the same criteria, these differences likely reflect discipline-specific factors, as economic education more frequently integrates professional terminology into problem-solving and interdisciplinary activities.

The analysis of terminology teaching effectiveness for different specialties confirmed that results largely depend on the profile of the training program. Economics students performed consistently well, technical students showed average results, and military students performed lower, highlighting the need for a differentiated approach. For military students, more practical exercises and simulations are recommended; for engineering students, interdisciplinary tasks; and for economics students, integration of terminology into real projects and case studies. The results confirmed the hypothesis on critical thinking development. Post-experiment, 68% of economics, 62% of engineering, and 49% of military students correctly applied terms in new professional contexts, demonstrating enhanced analytical skills and adaptability. Lower performance among military students highlights the need for specialized tasks targeting critical thinking and flexible use of terminology.

Overall, the results show that integrating terminological vocabulary enhances communicative and professional competence, boosts motivation, develops critical thinking and adaptability, and improves educational effectiveness. Practical recommendations include incorporating terminological modules, digital platforms, and interdisciplinary tasks into curricula to ensure effective mastery of terms across professional contexts and better prepare future specialists.

5.2 Comparative Analysis of Methodologies for Teaching Terminology in Higher Education

Qualitative analysis of terminology teaching in higher education highlights the value of combining theoretical and practical approaches. The lexical approach is central, promoting active use of terms in professional contexts. Through contextual learning, including case studies and simulations, students not only learn individual terms but also apply them in real situations,

enhancing critical thinking and analytical skills (Koval, 2013). The lexical approach can be enhanced with contextual learning and digital tools, enabling comprehensive mastery of terminological vocabulary. This integration allows students to apply terms in professional activities, developing communication skills and readiness for their duties (Holinaty, 2023). Combining lexical and contextual methods with project-based learning and digital technologies effectively integrates terminology into professional training, supporting students' adaptation to modern labor market demands (Table 6).

Table 6. Analysis of methodologies for teaching terminology in higher education curricula

Methodology	Description	Advantages	Disadvantages	Examples of usage
Traditional	Using standard textbooks and lectures to teach terminology.	Easy implementation, availability of materials.	The lack of individual approach, limited interactivity.	Technical courses.
Interactive	Using interactive methods such as discussions, role-playing games, simulations.	Increasing student engagement, developing communication skills.	More resources and training for teachers.	Management and communications courses.
Project-based	Learning through projects involving the use of terminology.	Development of practical skills, application of knowledge in real situations.	Difficulties in assessing student's individual contribution.	Engineering and architectural programs.
Online learning	Using online platforms and resources to learn terminology.	Flexibility in learning, access to a large number of resources.	Technical problems, need for self-discipline.	Information technology courses.
Integrated	Combination of traditional and modern teaching methods.	Balanced approach, ability to adapt to different learning styles.	Requires careful planning and coordination.	Economic, military industry, hotel and tourism business courses.

Source: Kisil (2020)

In the context of globalization and digitalization, higher education employs lexical, contextual, project-based, online, and integrated approaches (Koval, 2013). Approaches that promote active student participation support critical thinking and the application of knowledge in real professional contexts (Byrd & Coxhead, 2010). These include distance learning, IT-based methods, situational modeling, cooperative learning, individual consultations, and laboratory work, each with advantages and limitations depending on goals, resources, and student needs (Voron, 2022). Effective integration of these methods for teaching terminological vocabulary enhances educational quality and prepares highly qualified specialists while accounting for individual student characteristics to maximize learning outcomes and professional communication (Kisil, 2020).

5.3 A model for Optimizing Terminological Vocabulary Integration in Higher Education

The introduction of interactive technologies and distance learning enhances the assimilation of terminological vocabulary (Liu, 2012). Globalization requires students to master international terminology and adapt to diverse cultural contexts, while the lexical approach supports the development of intercultural communication skills (Pawley & Syder, 2021). Integrating terminology into curricula improves education quality and equips students with essential professional skills. Continuous refinement of teaching methods is therefore crucial to maximize learning outcomes and professional communication (Table 7).

Table 7. Criteria for terminological vocabulary level assessment

Assessment criteria	High level	Medium level	Low level
Terminology acquisition	The student uses terminology freely in professional communication and written works.	The student uses terminology with some errors, but generally understands its meaning.	The student has difficulty using terminology and often makes mistakes.
Professional communication	The student communicates effectively with colleagues and teachers using specialized vocabulary.	Student communicates with some difficulties though clearly.	The student has significant difficulties in professional communication due to insufficient knowledge of terminology.
Understanding the subject	The student demonstrates a deep understanding of the subject and can explain complex concepts.	The student understands basic concepts but has difficulty in explaining complex aspects.	The student has a superficial understanding of the subject and cannot explain complex concepts.
Practical skills	The student confidently applies terminology in practical tasks and projects.	Student applies terminology with some errors in practical tasks.	Student has difficulty applying terminology in practical tasks.
Intercultural communication	The student communicates effectively in an international environment using appropriate terminology.	Student communicates in an international environment with some difficulties.	The student has significant difficulties in international communication due to insufficient knowledge of terminology.

Source: Alali and Schmitt (2012)

To enhance student outcomes, curricula should be continually developed to integrate terminological vocabulary into practical tasks and real professional contexts (Ancker, 1999). Developing a model that optimizes the use of terminology and the lexical approach is key to improving language fluency. Such a model ensures effective term acquisition, practical application, and integration of the lexical approach with other teaching methods (Alali & Schmitt, 2012). The model aims to optimize learning by enhancing terminological vocabulary acquisition and developing students' professional competence. Its tasks include identifying field-specific terminology, designing systems for integrating terms into the curriculum, determining effective teaching methods, and evaluating model implementation. Analyzing terminology in specific disciplines is essential for this process (Palamar, 1997). Figure 1 presents indicators of the lexical approach's effectiveness.

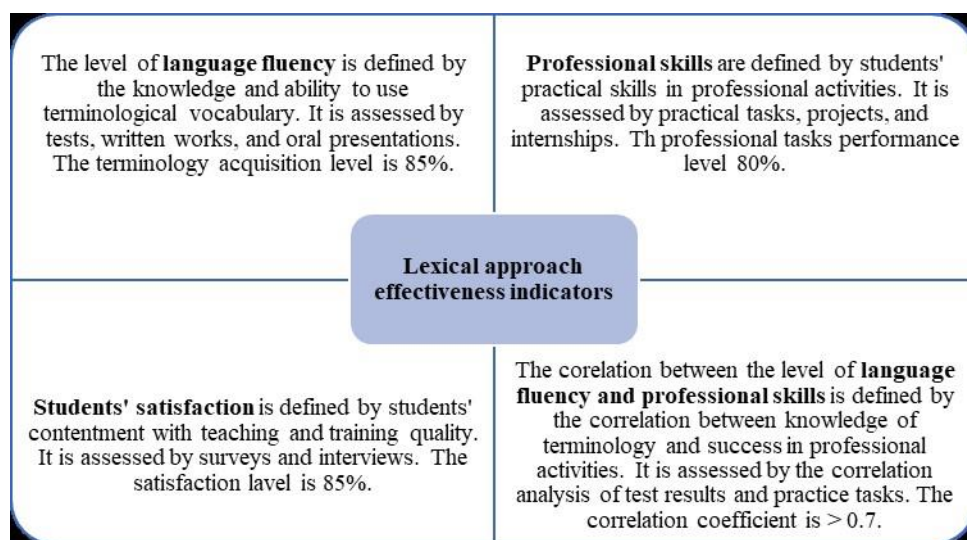


Figure 1. Lexical approach effectiveness indicators

Source: Redko (2012)

As a result, a notable progress in the students' professional training level is expected, including their ability to effective professional communication. Creating the model for optimizing the use of terminological vocabulary and lexical approach in higher education curricula is an important step in improving students' training. The study proves that effective terminology acquisition and its integration into the educational process promotes the development of professional competence (Coxhead et al., 2015).

6. Conclusions

The study confirms that integrating the lexical approach into higher education curricula offers clear benefits. Results show a direct link between systematic acquisition of terminological vocabulary and the development of professional communicative competence, demonstrating the approach's effectiveness for non-linguistic majors. Regarding the first hypothesis, students in the experimental group showed significant improvement in written and oral communication tasks, highlighting the importance of incorporating specialized terminological modules and emphasizing the practical use of terms in professional discourse.

The second hypothesis, which predicted that the effectiveness of terminological vocabulary varies depending on the specialty, was also confirmed. The most significant improvement was observed among economic students, the average improvement was demonstrated by engineering students, while the lowest improvement was observed among military students. This emphasizes the need for a differentiated approach to terminology integration, namely: it is advisable to include more practical tasks and simulations for the military; interdisciplinary cases are important for engineering students; and economics students will benefit from real projects and practical exercises.

Regarding the third hypothesis about increasing students' motivation, the results showed a significant increase in interest in learning in the group that worked with terminology. This confirms that systematic mastery of terms stimulates active student participation in classes and improves learning outcomes. Therefore, university teachers are advised to use interactive methods and digital platforms for independent mastery of terminology.

The fourth hypothesis, which concerned the development of general linguistic competence through a lexical approach, was also confirmed. Students in the experimental group demonstrated a greater ability to adapt terms to specific contexts and interpersonal interactions. Hence, the recommendation is to introduce interdisciplinary practical tasks and group

projects that encourage the use of terminology in real-life communication situations.

Finally, the fifth hypothesis about the formation of critical thinking regarding the use of terms in new contexts was confirmed. Most students in the experimental group were able to apply terms in changed situations correctly although its level among military students remained below average. This indicates the need for additional methods for developing analytical and critical skills in professional disciplines.

This study has several limitations, including a relatively small sample (120 students across three majors), limited assessment tools (tests and written assignments without long-term observation), short experimental duration, and potential survey bias. Although teaching quality was monitored, factors such as individual teaching style, use of digital tools, and teachers' disciplinary expertise may have influenced outcomes. All teachers were fluent in English and experienced in ESP instruction, but their professional backgrounds varied by specialty. Future research could address these limitations by expanding the sample, including additional specialties, conducting long-term competence tracking, and incorporating digital platforms for interactive terminology learning, thereby deepening understanding of the lexical approach's impact and optimizing training programs.

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Authors contributions

Prof. Tetiana Sharhun and Dr. Iryna Tarasiuk were responsible for study design and revising. Prof. Anna Zhukova was responsible for data collection. Prof. Mariana Levko drafted the manuscript and Assoc. Prof. Mariia Voloshyn revised it. All authors read and approved the final manuscript. In this paragraph, also explain any special agreements concerning authorship, such as if authors contributed equally to the study.

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