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## OPTIMIZING FOREIGN LANGUAGE TEACHING TO ENGINEERING MASTERS' STUDENTS

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The article analyses the actual problems of teaching foreign language professional communication in the master's program of an engineering higher education institution. The author emphasizes that to enhance foreign language teaching; we must adopt a competence-based approach and organize the learning process in a modular way. Additionally, incorporating information and communication technologies, including project-based activities, is crucial for improving education in higher technical schools. By doing so, we can ensure that the content of teaching foreign language communication aligns perfectly with the demands of the labor market and professions. It also meets the expectations of master's students for excellence and professionalism. Using information and internet technologies during project activities not only helps master's students develop their foreign language skills, but also improves their research abilities. It fosters the cultivation of personal creative research knowledge and skills, as well as the ability to collaborate effectively within a team setting. Through this, the creative aptitude of each master's student can be effectively realized. This article highlights the invaluable expertise acquired by applying information and Internet technologies in foreign language classes at the Ukrainian Engineering Pedagogics Academy (Kharkiv) at the Master's level. Additionally, it explores how these technologies have greatly contributed to the independent and research work of Master's students. These educational activities have been found to greatly enhance the traditional approach to foreign language instruction, proving to be a highly efficient method. The activities provided offer a variety of cognitive, training, creative, and research exercises to enhance the foreign language skills of advanced students. These exercises involve addressing difficult and real-life situations. By employing such technologies, computer-based learning becomes increasingly prominent in foreign language education. As a result, the effectiveness, intensity, and individualization of language teaching improve significantly. Additionally, new forms of language instruction are introduced, even in unconventional learning environments. This approach strives to create a more immersive and dynamic language learning experience.

**Keywords:** Master's student of engineering specialties, information and communication technologies, modular construction of the program, foreign-language professional communicative competence, interdisciplinary approach.

**Зеленін Г.І.** "Оптимізація процесу підготовки магістрів інженерних спеціальностей з іноземної мови".

У статті досліджується актуальне питання навчання іншомовного професійного спілкування у магістратурі інженерного закладу вищої освіти. Автор висвітлює, що одним із засобів оптимізації змісту та структури навчання іноземної мови визначаються компетентнісний підхід, модульна організація процесу навчання та застосування інформаційно-комунікаційних технологій, у тому числі при організації проектної діяльності як одного з напрямів удосконалення освітнього процесу у вищій технічній школі, що дозволяє якнайповніше забезпечити відповідність змісту навчання спілкування іноземною мовою вимогам ринку праці та професій, а також запитам магістрантів до професіоналізму та професійності. Використання інформаційних та інтернет-технологій у процесі реалізації проектної діяльності сприяє не тільки ефективному формуванню компетентностей у сфері іноземної мови, що вивчається, а й дослідницької позиції магістранта, системи особистісних творчих дослідницьких знань та вмій, здатності працювати у команді, що допомагає ефективній реалізації творчого потенціалу кожного магістранта.

У статті наводиться практичний досвід застосування інформаційних та інтернет-технологій на практичних заняттях з іноземної мови в магістратурі (Українська Інженерна Педагогічна Академія, Харків), а також під час самостійної та науково-дослідної роботи магістрантів, та зроблені висновки, що вищезазначена навчальна діяльність - ефективний засіб удосконалення традиційної методики

викладання іноземної мови. Наведені приклади пізнавальних, тренувальних та творчо-дослідницьких вправ, спрямованих на розвиток іншомовної компетентності магістрантів, які включають розв'язання проблемних та побутових ситуацій, використання вищезазначених технологій призводить до підвищення ролі комп'ютерного навчання у сфері викладання іноземної мови, поліпшувати його ефективність, інтенсивність та ступінь індивідуалізації, впровадити нові форми викладання іноземної мови в нестандартних навчальних ситуаціях, тобто зробити умови та процес викладання іноземної мови більш гнучким.

**Ключові слова:** магістрант технічних спеціальностей, інформаційно-комунікаційні технології, модульна побудова програми, іншомовна професійна комунікативна компетенція, міждисциплінарний підхід.

**Problem statement.** One of the most significant issues of higher professional training in the system of Master's degree at an engineering university is to develop students' ability and competence in business, professional and scientific communication at the multinational level. Fluent English as a means of communication not only in the context of daily life, but, foremost, in professional and scientific activities, is currently recognized as a part of the general competence of a Master's degree graduate in all training directions.

The two-level education system provides an opportunity to obtain at the first level in Bachelor's degree a fundamental wide-profile basic training university, at the second level in Master's degree the further professional and personal development of the bachelor is assumed as well as the possibility of individualizing training. The principal objective of Master's studies is to improve competences to the level allowing to establish cooperation with foreign partners and to develop constructive solutions to problems in the chosen professional activity. Foreign language teaching programs in Master's degree courses of different training directions, realized at UEPA (Ukrainian Engineering Pedagogics Academy, Kharkiv), provide for the development of key competences in the field of foreign language and their goal is to achieve by Master's students the level of practical English, which would allow them to use it in their future career and scientific activities, as well as in everyday communication.

The main characteristics of the educational process in the Master's course are the integration of disciplinary areas of knowledge, connection with science and practice, considering the socio-economic tasks of the region's development and orientation to the quality of education and the needs of the labor market and professions [2]. A graduate of the Master's program should have a high culture of thinking, skills for analyzing and synthesizing information, the ability to set goals and choose ways to achieve them, as well as possess the techniques and methods of scientific discussion and communicative activity in the conditions of the professional community. In this

regard, teaching an English language in Master's programs involves strengthening the interdisciplinary component of scientific knowledge and provides greater freedom in the choice of topics and types of activities. Priority is given to the development of skills in writing summaries, abstracts, abstract translations, as well as the ability to professionally present the results of their research and represent them as scientific publications and presentations in English.

Also, a graduate with a Master's degree should possess a number of competencies inherent to a researcher: proficiency in the methodology of scientific research and modern information technologies, the ability to demonstrate and apply in-depth knowledge in the chosen field, taking into consideration modern principles of scientific research; the ability to collect, process and interpret the data of modern national and foreign scientific research, necessary for the formulation of conclusions on the relevant scientific, professional, social and ethical issues.

To achieve the set goals and objectives requires the development of master's students' learning and cognitive competence and development of their sustainable positive motivation to learn a foreign language at an engineering university, which includes the active use of modern information and communication technologies, competence-based approach and modular organization of the educational process, allowing to ensure the fullest compliance of the foreign language communication training content with the requirements of the labor market and professions, as well as the master's students' requests for professional training.

**Literature review.** At present, the professional component of foreign language training is one of the important directions of foreign language departments of engineering universities. Depending on the training directions of a higher educational institution, teaching and methodical materials for the development of professionally oriented foreign language have been developed. Foreign language teachers often use materials from

foreign manuals based on communicative teaching methods, which brings the learning process to life, but does not always reflect the lexical material of the student's future professional activity. The department has developed an integral method of collaborative work of foreign language and technical disciplines teachers to introduce professional content into the teaching and learning material that solves the problem of lack of necessary highly specialized engineering knowledge of foreign language teachers. There is also a large number of works abroad devoted to the concept of professionally oriented foreign language. There is English for Specific Purposes training, consisting in the skills and abilities to communicate in a professional language to solve highly specialized tasks. English for Academic Purposes is required to train researchers who are able to write scientific articles and abstracts, to present their projects at conferences and to work in an English-speaking research environment. The main advantage of foreign language training of specialists in foreign universities is the possibility of full immersion in the language professional environment through foreign internships, which are a necessary component of the curriculum, making the learning process natural and quicker (Andy Gillett, Liz Wray, Nick Pilcher, Simon Kinzley, Sonya Saunders).

**The purpose of the article** is to analyze the problems of teaching foreign language professional communication in the master's program of an engineering higher educational institution, to identify means of optimizing the content and structure of foreign language teaching and to highlight the possibilities of using computer technologies in the process of organizing course "Foreign language for professional and business communication".

**The statement of the main material.** Ukrainian Engineering Pedagogics Academy (UEPA) is involved in international activities and conducts an active policy of foreign language training development among students and professors. One of the priority directions of scientific and educational activities of UEPA is engineering pedagogics. In the rapidly changing conditions of economic development and active policy of European integration, the issue of training highly qualified personnel capable of working in the international environment with skills of business and professional foreign language communication is becoming acute. Therefore, the development of new teaching and methodological complexes, the creation of

professionally oriented content and the introduction of advanced methods of teaching foreign languages are relevant for the educational process of an engineering university. The most appropriate stage of professionally oriented foreign language training is Master's degree. At this level of the educational process, a student already has the necessary basic knowledge of a foreign language acquired in Bachelor's degree and, importantly, the basic knowledge of engineering disciplines. This allows introducing highly specialized content into the teaching and learning material of the «A foreign language in professional activity" discipline, corresponding to the future professional activity of a Master's student.

The realization of features and specific principles of modular learning, such as variability, adaptability, structuring of learning, problem solving, implementation of feedback, provides its most important characteristic - flexibility, allowing us to quickly update or replace specific modules when the requirements for a specialist change, ensuring the quality of training at a competitive level; gives the opportunity to individualize training, based on the student's level of knowledge and skills or work experience by combining the necessary modules, allows you to apply the same modules as elements of several training programs (professional foreign language, foreign language of business communication, ethics of business relations) [4].

Specially developed educational working program, consisting of educational and methodical complex and a set of evaluation tools, gives Master's students the opportunity to work independently with this program, using it completely or replacing individual elements in accordance with their needs.

Expansion of interdisciplinary links and integration of the department of Foreign Language Training, European Integration and International Cooperation and specialized departments in order to improve the quality of education on the basis of the actual "order" of the specialization departments and the creation of a multi-lingual environment of the engineering university provides the integration of specific content related to specific professional activities and general content related to the skills of effective business and professional communication in a foreign language.

The possibilities of interdisciplinary approach in teaching foreign languages can be fully realized when teaching undergraduates to abstract and annotate professionally oriented and scientific texts, as well as when teaching abstract

translation. In situations of professional communication, there is often a need for oral or written summarization of foreign-language materials containing valuable information. It is also common practice to publish scientific articles in journals and thematic collections in the native language with an abstract of their main content in another language. In this module, special attention should be paid to enriching the vocabulary and performing tasks on compiling a glossary on the subject of the profile. In selecting lexical units for memorization, it is necessary to take into consideration the clichéd speech and the frequency of using these words in the speech of business and professional communication, trying to combine general business and narrow professional vocabulary, including terminology.

Special attention should be focused on the choosing the topics of authentic textual material, which would reflect the specifics of the future activity of a Master's student, supplement and modify the content of the profile. The main criteria determining the selection and organization of educational material are the following: authenticity of educational materials, their genre diversity; orientation of educational material not only to extend the knowledge base, but also to transform the personal experience of each student; informativeness; relevance and reliability; motivation for intercultural comparison. In addition, taking into consideration the multilevel training of students, Master's students can be offered a module of intensive language course in grammar, aimed at improving lexico-grammatical competence and skills of using syntactic constructions, characteristic of oral and written professionally oriented and scientific communication. As practice shows, the level of grammatically and stylistically correct speech is far from perfect for many Master's students. Incorrect use of grammatical forms, orthographic, syntactic and stylistic errors often lead to distortion of the information meaning and misunderstanding of business partners.

Nowadays, due to the processes of globalization and integration, almost everyone has to face an ever-increasing amount of foreign-language business correspondence in their work. Therefore, the program should include one more important module - teaching written business and scientific communication in a foreign language. It is necessary to introduce master's students to the peculiarities of scientific and business style of written communication in a foreign language in the context of the specialty. The analysis of authentic professionally oriented materials, preparation on

their basis of their own samples of scientific communication in English allows Master's students to identify and then assimilate the system of basic parameters and requirements for different types of scientific written communication.

In addition to preparation for professional activity and for life, the purpose of education in the information society is the direct inclusion of students in the life process itself, which implies mastering the methods of self-development and self-education. In the educational process, students fully develop skills of independent research activity, critical thinking skills, and the ability to communicate and work together with others. It is the use of the "pragmatic" educational model allows to effectively applying at engineering universities the means of information and communication technologies providing the development of information culture through the information competence formation. Intensification and optimization of education, adaptation of a future competitive specialist to life in the information society, training for the information culture development of an engineering university student - all these processes take place through the use of information and communication technologies, which are introduced into the educational process by combining the achievements in the field of information technology, psychology and pedagogics into a single whole.

The nature of the media for information transmission in a certain way affects the formation and development of human thinking abilities. For example, printed text has a linear structure characterized by linearity, consistency, subject, rationality, and as a source of information is built on the principles of abstracting content from reality. This forms a way of thinking similar to the structure of printed text. Computer means of information transfer have a non-linear structure, which is based on the model of recognition; they use the method of visualization, contributing to the formation of professional thinking by systematizing and highlighting the most significant elements of learning [1]. The process of visualization is the coagulation of thought content into a visual image that can be deployed and that can serve as a support for adequate thinking and practical actions. Practically any form of visual information contains elements of problematic nature, the resolution of which is carried out based on analysis, synthesis, generalization, convolution or deployment of information. Moreover, the higher the problematic nature of visual information, the higher the intensity of the learner is thinking activity. Furthermore, in terms of ICT application, it should be emphasized that the modern generation of



students spends more and more time on the Internet and communicates more often in the virtual world than in the real world.

This is the precondition for the active integration of information and communication technologies into the teaching process. Due to the increasing speed of information flows, leading to the impossibility of traditionally analyzing data, which in addition quickly become outdated, the question arose about the need to present the teaching foreign language information graphically as it is the most natural for a human being.

Such mental functions as perception, memory, etc. are also influenced by computerized means of information transfer. Application of information and Internet technologies in education has a pedagogical impact on the student with the following main objectives:

- to develop certain types of thinking - visual-imaginative, visual-action, creative, intuitive, theoretical, etc.;
- to form a "spatial" vision, the ability to analyze, synthesize, abstract, generalize;
- to teach optimal decision making;
- to train independent representation and retrieval of knowledge;
- to form the skills and abilities to carry out experimental-research activities.

Therefore, when learning material is provided by means of information and Internet technologies, different channels (hearing, vision, etc.) are involved in the process of perception, allowing to put educational information into long-term memory, and the key to retrieve it is any of the signals directed to the brain (e.g., a word or an image).

Organization of foreign language teaching for engineering masters assumes taking into consideration the students' needs, interests and personal characteristics, which is nowadays closely related to the use of information technologies. The active application of modern information and Internet technologies in the teaching process is one of the key principles on which the foreign language program for engineering masters at UEPA is based. The necessity of using information and Internet technologies in the process of teaching foreign languages is determined both by the requirements of modernity to the training level of a master's degree graduate and by the increasing volume of information that students need to perceive and study and creatively process in the course of their studies. Therefore, using modern information and Internet technologies is one of the most effective means of increasing the productivity of pedagogical work at higher educational engineering institutions, as well as the quality of foreign language teaching.

Unfortunately, a few classroom hours are allocated for studying foreign language in Master's degree programs in engineering. At the same time, the goals and objectives of the course, which were mentioned above, are quite complex. This contradiction increases the importance of independent work based on information and Internet technologies in the educational process of Master's degree program.

Being based on the fact that the main part of work using modern technologies is an extracurricular students' independent work, we consider the classroom work as a preparatory stage for the independent fulfillment of tasks. The major content of engineering undergraduates' independent work using information technologies in teaching a foreign language is the implementation of different kinds of creative tasks related to the search for information on the Internet. In particular, such search is necessary for writing essays and preparing reports and presentations in a foreign language on topical issues of science and technology with their subsequent discussion in class. In order to prepare reports and presentations of high quality, students should search for necessary materials, select and process them. As sources of materials for essays, reports and presentations, we would recommend specialized websites where thematic articles are posted, as well as social networks, forums and blogs where discussions on topical issues of modern science and technology take place [5].

At present, leading scientific journals have online versions where one can find either full-text versions of articles or their abstracts. In order to work with these sources, master's students should have the skills to search for information on the Internet, adequately select keywords and carefully evaluate the results offered by search engines. In addition to standard search engines, master's students should be able to use the resources of ResearchGate, Google Scholar, which are oriented to search specifically for scientific articles, reviews, dissertations, patents, etc.

In performing the tasks of identifying key words and compiling a glossary on the subject of the read articles on specialty, master's students are acquainted with the possibilities of computer programs and lexical corpora, in particular, The Open American National Corpus or The British National Corpus and others. We also consider it necessary to pay attention to the development of master's students' skills of using machine translation systems correctly and post-editing texts translated with their help. It is important to introduce them to the capabilities of DeepL

Translate, Reverso Translate etc. applications, allowing them to translate and post-edit texts in the most optimal and efficient way.

The tasks involving the application of information technologies are essentially different from traditional exercises, because in order to perform them, masters need to use the previously acquired knowledge not only in the foreign language, but also in the application of computer and Internet resources, to perform a certain amount of work and present the results in a given format, i.e. to create a "product" of their learning activity [6].

The tendency of today is the active use of mobile applications, which cannot be ignored in teaching foreign languages. Masters should be pointed out that with the help of mobile applications they can access online dictionaries and other sources of information useful in learning a foreign language. Mobile applications make it possible to access necessary resources in transportation, on vacation, and in other situations.

Most of the above-mentioned information and Internet technologies are designed for individual independent work of the student [10]. At the same time, it is possible to offer the use of these technologies for the group work organization in a foreign language. In particular, we offer MindMaps technology for organizing group work of students on an article. A group of masters (6-7 students) is given the task to analyze an article on their specialty in a foreign language and to present its main content (concepts, ideas, results) as an intellectual map.

The creation of an intellectual map is a small group project, realized during one or two classes. Students in a group independent work prepare the maps, and the results are discussed in the classroom. Based on their intellectual map, the group presents the content of the article they have studied, and members of other groups study the map, listen, ask questions, and assess the success of the project.

Project activity of masters is nowadays considered to be one of the important directions of improving the educational process in higher professional education. Participation in-group projects is an important component of the educational process, a necessary means of increasing motivation for learning, as well as a means of quality professional training. Today it is generally recognized that students' preparation for project activity and its realization in the conditions of modern educational process is closely connected with the application of information technologies. One of the versions of a large educational project, designed for implementation during a semester, is the creation by students of

wiki pages in the foreign language being studied. A mini-group of 4-5 masters chooses the topic of the wiki page and for two months works on it independently, consulting with the teacher if necessary. At the end of the project, the teacher controls the accuracy of the language, correct mistakes and improve the style. Then all masters in the academic group are given access to the wiki pages created by different mini-groups, given the opportunity to leave comments and ask questions. At the end of the semester, the wiki pages are collectively discussed and assessed [8].

This kind of master's students' project activity in a foreign language with information and Internet technologies contributes not only to the effective competence development in the foreign language, but also to the master's research position, the system of personal creative research knowledge and skills, the ability to work in a team, helps to effectively realize the creative potential of each master's student. Application of information and Internet technologies makes foreign language learning more practice-oriented, strengthens the learning motivation, increases the level of Master's students' culture, broadens their outlook, helps to overcome routine in learning and prepares Master's graduates for future professional activity in the international community.

**Conclusion and further research prospects.** In conclusion, it should be emphasized that the unity of academic and market characteristics of higher professional education can be achieved to the maximum extent at the stage of Master's degree: training of highly qualified competent specialists of professional orientation, as well as training of research staff. The readiness for business and professional communication in a foreign language is an integrative professionally significant quality of a specialist, providing him/her with the relationship of parity cooperation and developing constructive solutions to problems with foreign partners, and becomes one of the main needs of employers of developing enterprises, companies and firms.

As teaching practice shows, the application of information and Internet technologies in practical foreign language classes at the master's level and during the independent and research work of master's students is an effective means of improving the traditional methodology. An example of this is a system of cognitive, training and creative research exercises aimed at developing the foreign language competence of master's students, including solving problematic and everyday situations that they need to solve. Practical and methodological solutions to these

problems can lead to an increase in the role of computer-based education in the sphere of foreign language teaching, improve its efficiency, intensity, and degree of individualization, implement new

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