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## DEVELOPING SOFT SKILLS WITHIN ESP COURSE DESIGNED FOR FUTURE IT ENGINEERS

*The coming years will see big changes in the field of professional activity and labor resources caused by several factors. The most influential of them – development of information technologies, rapid growth of artificial intelligence technologies, production automation and robotics – have revolutionized the field of professional activity providing a wide range of tasks that were once only within the power of humans. These factors bring about developing new conditions in business environment and labor market.*

*Soft skills – communication and cooperation skills, critical thinking, and creativity skills – should become in demand in the technological progress and dynamically changing business environment of the beginning of the XXI century. Competency-based English curricula are an excellent tool their development.*

*The article presents the analysis how the soft skills correlate with the professional competencies and learning outcomes acquired by IT students and how they are distributed across the curriculum.*

*Regarding the distribution of soft skills across the curriculum, it was defined that all types of soft skills are components of the professional competencies and learning outcomes acquired by IT students while studying the course content. The soft skills are deeply integrated into the educational content of the four modules of the ESP program which was designed in such a way that the priority in teaching English was formation of professional competencies and obtaining learning outcomes aimed at the practical use of English as a tool to achieve professional goals and to translate theoretical knowledge into practice. The analysis shows the soft skills are not equally presented in the educational program. Soft skills are implicitly built into the curriculum of the ESP course which allows future software engineers respond the challengers of the contemporary work environment and be competitive in the labor market. All these provisions are basic for training future specialists in any engineering specialty.*

***Key words:*** *soft skills, professional competencies, learning outcomes, IT students, ESP syllabi.*

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## РОЗВИТОК М'ЯКИХ НАВИЧОК В РАМКАХ КУРСУ ESP, РОЗРОБЛЕНОГО ДЛЯ МАЙБУТНІХ ІТ-ІНЖЕНЕРІВ

*У найближчі роки відбудуться великі зміни у сфері професійної діяльності та трудових ресурсів, спричинені кількома факторами. Найвпливовіші з них – розвиток інформаційних технологій, стрімке зростання технологій штучного інтелекту, автоматизація виробництва та робототехніка – зробили революцію у сфері професійної*

*діяльності, надаючи широкий спектр завдань, які колись були під силу лише людині. Ці фактори призводять до формування нових умов у бізнес-середовищі та на ринку праці.*

*В умовах технологічного прогресу та динамічно мінливого бізнес-середовища початку XXI століття особливо затребуваними мають стати «м'які навички» – навички комунікації та співпраці, критичного мислення, креативності. Компетентнісно орієнтовані навчальні програми з англійської мови є чудовим інструментом їх розвитку.*

*У статті представлено аналіз того, як м'які навички співвідносяться з професійними компетенціями та результатами навчання, яких набувають студенти IT-спеціальностей, і як вони розподіляються в навчальній програмі.*

*Щодо розподілу м'яких навичок у навчальній програмі було визначено, що всі види м'яких навичок є складовими професійних компетентностей та результатів навчання, яких набувають студенти IT-спеціальностей під час вивчення змісту курсу. М'які навички глибоко інтегровані в навчальний зміст чотирьох модулів програми з англійської мови професійного спрямування, яка була розроблена таким чином, що пріоритетом у навчанні англійської мови було формування професійних компетентностей та отримання результатів навчання, спрямованих на практичне використання англійської мови як інструменту для досягнення професійних цілей та переведення теоретичних знань у практичну площину. Аналіз показує, що м'які навички не однаково представлені в освітній програмі. Вони імпліцитно вбудовані в програму курсу англійської мови професійного спрямування, що дозволяє майбутнім інженерам-програмістам відповідати на виклики сучасного робочого середовища та бути конкурентоспроможними на ринку праці. Всі ці положення є базовими для підготовки майбутніх фахівців будь-якої інженерної спеціальності.*

***Ключові слова:*** *м'які навички, професійні компетенції, результати навчання, студенти IT-спеціальностей, навчальні програми ESP.*

**Setting of a problem**. Global changes are currently taking place in many areas of life. Many researchers predict that in the coming years we should expect big changes in the field of professional activity and labor resources. The concept of profession is no longer as clear-cut as before and is changing its content. The functions of a worker in a workplace are expanding, he or she has to pick up more and more new skills. Several factors contribute to these processes. In particular, the development of information technologies has revolutionized the field of professional activity. In business, banking and financial sector, trade, education, and other areas accessibility of information, creation of databases, electronic document management, automation of writing accounts and banking operations, provision of services and interaction with customers on the Internet, online payments, video conferencing, and webinars have already become a normal part of the everyday life. Information technologies are changing not only the forms of professional activity and requirements for the competences of modern specialists. At least the basics of computer proficiency today is a prerequisite for employment in almost any field.

The workplace has also undergone significant changes and no longer resembles what it used to be. Personnel are no longer bound to a specific space and working hours; team members can be located in different cities, countries and even continents. The introduction of advanced information technology makes it possible to create intercontinental companies, to reorganize traditional ways of doing business. All this has made and will continue to make labor and workers more flexible, adaptable to new conditions and challenges.

Work itself is becoming less routine, requiring skills and knowledge from many related fields.

The labor market is also undergoing significant changes. Production automation and robotics have made it possible to significantly reduce the number of employees, while reducing the cost and volume of production fault. The rapid growth of artificial intelligence technologies provides a wide range of tasks that were once only within the power of humans. And this trend will continue to grow in the future. According to the estimates about 47% of total employment in the United States is at high risk of being automated relatively soon, perhaps within the next decade or two (Frey, Osborne, 2013). Experts suppose that many existing occupations will disappear within this period. They also predict emergence of new ones describing changes in the qualification frameworks and responsibilities of the worker.

Over the past 20 years, project work, as one example of non-standard activity, has increased 40-fold, making collaboration and teamwork more important than ever (McFarlan, Benko, 2004).

All these factors bring about developing new conditions in business environment and labor market.

The U.S. Department of Education emphasizes (Augustine, 2007) that 60% of all new jobs in the early 21st century require skills that only 20% of the current workforce possesses, which means there is an urgent need to redesign the entire preparation process for future work careers, especially in higher education. Successful work performance will increasingly depend on a worker's ability to analyze problems, process and communicate information (World Economic Forum, 2016). It means that flexible skills should

become in demand in the technological progress and dynamically changing business environment of the beginning of the XXI century. The participants of the World Economic Forum noted that the transformation of education in the conditions of technological revolution leads to increased demand for flexible skills which are defined as a critical factor of employment in the conditions of modern labor market (World Economic Forum, 2015).

Thus, this trend is of particular relevance now. This can be explained by the fact that the main external consumers of higher education institutions' services are employers (enterprises, organizations, public authorities, etc.), who hire university graduates and expect them to possess a set of professional competencies that meet the requirements of the innovative economic and social model development.

It should be noted that recently there has been a gap between the real needs of employers and the level of professional education that graduates receive. First of all, employers when hiring specialists pay attention to how well the potential employees' soft skills are developed. According to research conducted at Harvard and Stanford Universities, only 15% of career success can be provided by «hard skills», while the remaining 85% – by «soft skills» (Koval, 2015).

**Literature Review**. Developed «soft skills» give an advantage at employment: when choosing between several applicants for a position with approximately the same set of hard skills, the employer will make a decision in favor of the candidate with more developed soft skills. This is quite understandable: it is possible to learn how to work in an unfamiliar computer program in a few days, but it is impossible, for example, to learn to resolve conflicts or acquire leadership qualities during the same time.

"Soft skills" generally reflect the employee's approach to work. They are based on personal qualities and interaction with other people. Employers around the world are looking for self-confident people who can use their skills to participate effectively in teamwork, persuade others, present their ideas, and develop and maintain interpersonal relationships. Professionals in different fields often do not know how to negotiate, argue, ask the right questions, and build effective communication when faced with the challenge of communicating in English with international partners. Some professionals have difficulties with public speaking and the inability to manage their time properly.

Soft skills refer to a set of non-specialized, supraprofessional skills responsible for successful participation in the work process and high labor productivity. They are not related to a specific subject area. Soft skills are also interpreted as the ability to see the whole, to identify patterns in complex objects, to communicate, and to be involved in teamwork.

Analysis of the literature shows that there is no single list of soft skills and there are many approaches to their interpretation and classification.

Some authors, based on their practical experience, offer a simple typology, according to which soft skills are divided into two large groups, which, however, are constantly intersecting: personal and interpersonal soft skills (Kornyush, 2020). Personal soft skills deal with self-organization and self-motivation (a combination of a positive attitude to work and academic tasks with the initiative to work hard); the ability to approach problems with a cool head and find the most beneficial solution in each specific situation; responsibility; determination (involving a balanced approach and forward thinking in decision making); the ability to work in stressful situations and the ability to allocate time wisely; flexibility (adaptability, ability to learn new things, open-mindness). Interpersonal skills include communication skills; emotional intelligence; empathy; the ability to speak out and be understood; the ability to hear (not just listen); leadership skills (not so much as the ability to lead but rather the ability to motivate others intelligently); teamwork skills; the ability to be persuasive and influential during speeches, discussions and negotiations, thoughtfully seeking a solution that satisfies all parties; the ability to achieve mutual understanding with others, etc.

Another popular approach to identifying the priority skills and competencies that need to be developed in a person to be successful in the modern world is the «4C» model (Koval, 2015), which reflects the main key soft skills. These include: communication, cooperation, creativity, and critical thinking. Communication: ease of establishing contact, the ability to negotiate, making conversation, public speaking skills, persuasive arguments, asserting one's interests, overcoming conflicts, effective listening, the ability to ask questions, conscious use of body language. Cooperation, collaboration: ability to join a group to solve a problem, teamwork skills, teamwork skills. Critical thinking: the skill and ability to reasonably evaluate a situation and correctly apply the obtained results to situations and problems; observation, the ability to interpret, analyze, and summarize. Creativity: productivity (the ability to create objects of creativity), flexibility (the ability to find new solutions, and the ability to effectively use existing material, as well as quickly change their thinking and behavior depending on the situation), originality (the skill of proposing new, unusual and unexpected ideas that differ significantly from already known), the ability to solve complex problems.

The competency-based 4C model offers more differentiation than the simplest model. It may be more useful for prioritizing the development of flexible skills in the education system.

Revealing the importance of soft skills is undoubtedly connected with overcoming disagreements between traditional teaching methods, which often create obstacles for efficient development of such competences of students as communication skills, critical thinking, etc. and application of active teaching methods within the competence-based approach, which is more effective for development of such competences.

Therefore, this approach is doubly effective for English language learning. English language learning in the 21st century is aimed at mastering personal and interpersonal communication skills (Cottrell, 2013). Competency-based English curricula are an excellent tool for developing soft skills.

The essence of the competence approach is that it focuses on the result of education, and the result is not the amount of information learned, but the ability of a person to act in various problematic situations. It is where the results of education become meaningful outside of the education system as well.

Competence is the result of the student's personal preparation, his ability to successfully meet individual and social needs, act and perform the tasks set. Competence is based on knowledge, skills and abilities, but is not covered by them, it necessarily includes the personal attitude of the person to them, as well as his or her experience allowing this knowledge to be implicated into what the person already knows, and his ability to understand the life situation in which it can be applied. Thus, each competence is built on a combination of knowledge, skills and abilities, as well as attitudes, values, emotions, behavioral components, i. e. everything that can be mobilized for activity (Nikolayeva, 2010). Increasingly widespread implementation of the competence approach indicates that the real knowledge is individual and it emerges and is formed as a result of the experience.

The modern stage of society development, dynamic shifts in educational policy trends, and the requirements that future graduates of technical universities face are prompting changes in approaches to learning. And it is the teachers who are to a great extent responsible for the development of professional competencies of students and, subsequently, future specialists.

**Goal of research.** The soft skills are deeply integrated into the educational content of the competence-oriented ESP course for IT students in National Technical University "Kharkiv Polytechnic Institute" (NTU "KPI"). The purpose of the research is to analyze how all the soft skills – communication and cooperation skills, critical thinking, and creativity – correlate with the professional competencies and learning outcomes acquired by IT students and how they are distributed across the curriculum.

**Statement of basic materials.** Several years ago, the Department of Foreign Languages of National Technical University "Kharkiv Polytechnic Institute" (NTU "KPI") developed and implemented a competence-oriented curricula and syllabi of bachelor ESP course (years 1–2, 124 academic hours) for students of IT departments, studying ESP in the first and second years.

They were presented in four modules:

1. Communicating in academic and professional environments;
2. Information search and analysis;
3. Information presentation;
4. Speaking Professionally.

The researchers report that in order to adjust course content and language learning methods, online surveys were periodically conducted with students to assess their achievements and find out their language learning preferences. In addition, a detailed analysis of the curricula of the various majors was conducted regarding the needs of students to acquire the necessary professional competencies (PC) and demonstration of learning outcomes (LO). Thus, a so-called needs analysis of both students and institutions of higher education was conducted.

The analysis of the curriculum in the field of software engineering has shown that the professional competencies which can be directly formed in future software engineers in the process of learning a foreign language are PC-1 (ability to analyze subject areas (domains), formulate requirements, identify, classify and describe the tasks, find methods and approaches to solve them); PC-4 (ability to apply and develop fundamental and interdisciplinary knowledge to successfully solve software engineering tasks); PC-1 (the ability to formulate and meet the requirements); PC-5 (the ability to prepare and present software documentation and manuals).

In addition, the analysis of the learning outcomes of the curriculum showed that the outcomes directly related to the ESP learning include LO-1 (the ability to know and have language skills, ability to communicate in a professional level dialogue with colleagues and subject experts); LO-2 (the ability to demonstrate processes and results of professional activities, developing presentations, reports); LO-1 (the ability to use information and communication technologies in communication, exchange, collection, analysis, processing information); LO-3 (the ability to

understand, analyze, purposefully seek and select the necessary information resources and knowledge essential for solving professional tasks, taking into account modern achievements of science and technology); LO-6 (the ability to have skills for participating in team development, coordination, design and release of all types of program documentation) (Goncharenko et al., 2019).

The abovementioned professional competencies and learning outcomes implicitly contain the components of soft skills. Raising the professional competencies and getting the learning outcomes allow students of IT departments develop their abilities that are beyond the professional sphere.

Considering the mentioned competencies and learning outcomes that students develop in English classes, we can trace how soft skills correlate with them. So, analyzing PC-1 (the ability to analyze subject areas (domains), formulate requirements, identify, classify and describe the tasks, find methods and approaches to solve them), we conclude that the development of this competence first of all implies developing critical thinking skills when it comes to analyzing domains, defining tasks, classifying them and finding methods and approaches to solve them, creativity in finding new solutions, and the ability to effectively use the available material, quickly change their thinking and behavior depending on the situation. PC-1 equally contributes to development of communication skills to adequately formulate problems.

Raising PC-4 (the ability to apply and develop fundamental and interdisciplinary knowledge to successfully solve software engineering tasks) student develops critical thinking skills to analyze information, the ability to interpret it; he also needs to develop creative approach to be flexible enough for solving professional problems.

PC-1 (the ability to formulate and meet the requirements) is acquired along with the development of communication skills, as the student learns to formulate tasks and be understood, to hear, not just listen; and cooperation skills, allowing him to interact with other team members when discussing and completing tasks.

PC-5 (the ability to prepare and present software documentation and manuals) involves the development of communication skills, expressed in this case by the ability to speak, interpret information, compose instructions, prepare documentation and present the final results of work appropriately.

The first and more general LO-1 (the ability to know and have language skills, ability to communicate in a professional-level dialogue with colleagues and subject matter experts) correlates with communication and cooperation skills and is presented in the form of learning monological and dialogic speech, namely in self-presentation, commenting on visual means of reflecting processes and trends, presenting results of the chosen research topic, dialogic speech when modeling conflicting professional situations with an employer or a colleague, interviews and answering questions, analyzing workers' skills required for work in the chosen sphere.

Obtaining LO-2 (the ability to demonstrate processes and results of professional activity, developing presentations, reports) implies developing communication skills, when students are taught the art of presenting the results of their work, giving their opinion and commenting processes and trends.

LO-1 (the ability to use information and communication technologies in communication, exchange, collection, analysis, processing the information) and LO-3 (the ability to understand, analyze, purposefully seek and select the necessary information resources and knowledge essential for solving professional tasks, taking into account modern achievements of science and technology) correlate with communication skills and critical thinking when students reading professional-oriented literature learn to understand the basic ideas, find the necessary information, determine the purpose of the publication, critically analyze texts, make reports, describe any graphical information, such as charts, tables, graphs.

LO-6 (the ability to have skills for participating in team development, coordination, design and release of all types of program documentation) implies developing cooperation skills as the ability to be part of a team, leadership, and the ability to be persuasive and influential during speeches, discussions, and negotiations, thoughtfully seeking win-win.

Considering the distribution of professional competencies and learning outcomes across curriculum modules (Goncharenko et al., 2019), it is possible to trace which soft skills are given the most attention in each of them. According to the researchers, PC-4 and LO-1 are accumulated in all four modules, which means that within the course future software engineers acquire critical thinking skills to search, analyze, interpret information, as well as creative approach to be flexible in solving professional problems; students develop communication and cooperation skills through different types of language activities, such as writing instructions and documentation, training in monological and dialogic speech, in the form of self-presentation, comments on visuals reflecting processes and trends, presentation the results of the chosen research topic, discussions, simulation of professional situations and interviews.

PC-1, LO-3 and LO-1 are developed when studying Module 2 «Information Search and Processing». In this module almost all types of learning speech activity are focused precisely on the ability to find and analyze information, compare, find causality and describe them through appropriate language tools and structures which require critical thinking. Creativity is also required for the ability to find new solutions and use the available resources effectively, to quickly find the necessary strategies to get the best result. Communication skills are also integrated in the module as students need to learn to formulate problems appropriately, make reports, describe any visual information.

LO-2 is achieved within Module 3 «Information presentation» when students presenting the results of their work and giving their opinion demonstrate how well they developed their communication skills.

**Conclusion**. Regarding the distribution of soft skills across the curriculum, it should be noted that all soft skills – communication and cooperation skills, critical thinking, and creativity – are components of the professional competencies and learning outcomes acquired by IT students while studying the course content. The soft skills are deeply integrated into the educational content of the four modules of the ESP program. The analysis shows the soft skills are not equally presented in the educational program: less opportunities are provided for developing the cooperation skills in comparison with the others.

It can be concluded that the program was designed in such a way that the priority in teaching English was formation of professional competencies and obtaining learning outcomes aimed at the practical use of English as a tool to achieve professional goals and to translate theoretical knowledge into practice. Soft skills are implicitly built into the curriculum of the ESP course which allows future software engineers respond the challengers of the contemporary work environment and be competitive in the labor market. All these provisions are basic for training future specialists in any engineering specialty.

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