

relevant report fragments; (2) semantic tagging of terminology and causality markers; (3) prompt design for generating summaries, glossaries, and B1–B2 learning tasks; (4) validation through comparison with the original report and expert review. Learning activities are exemplified in engine room communication (reporting a failure to the chief engineer, issuing urgency messages, and completing technical forms) and in analyzing human communicative error. Safe classroom use is outlined through retrieval-augmented generation (RAG) and mandatory fact-checking practices to minimize hallucination risks. The approach reduces teacher preparation time, supports individualization, and increases learner motivation while maintaining CLIL coherence. Expected learning outcomes include expansion of cadets' active technical lexicon, improving comprehension of complex reports, and higher accuracy in concise incident reporting aligned with IMO Standard Marine Communication Phrases. The model also develops critical digital literacy by training learners to evaluate AI outputs against verified evidence in real settings.

Key words: Maritime education, professional training, English for Specific Purposes (ESP), Maritime English, learning process optimization, artificial intelligence, large language models, natural language processing (NLP), maritime accident reports, цифрові технології, CLIL.

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FOREIGN LANGUAGE TRAINING IN TECHNICAL HIGHER EDUCATION INSTITUTIONS OF UKRAINE: PROBLEMS AND DEVELOPMENT PROSPECTS

The article examines the prospects for the development of foreign language training in technical higher education institutions of Ukraine. It emphasizes the importance of implementing both online and offline communicative interaction between Ukrainian technical universities and their international partners.

The study highlights that the expansion of students' communicative competence can be achieved by increasing classroom (contact) hours dedicated to direct communicative interaction. Particular attention is paid to the inclusion of professionally oriented topics within educational laboratories and workshops as a means of enhancing students' communicative potential.

The necessity of creating a foreign-language learning environment within technical universities is underscored, with a focus on coordinated subject-to-subject interaction and the comprehensive development of students' personal potential. The article also notes that the introduction of specialized supplementary courses, foreign language learning groups, as well as initiatives such as English Weeks and Days, plays a significant role in advancing foreign language training.

Furthermore, the development of professionally oriented (including integrated) English language curricula in close collaboration with instructors of technical disciplines is identified as an effective way to intensify foreign language education. Finally, attention is drawn to the need to enhance institutional capacity for foreign language training through the establishment of computer classrooms, language laboratories, and university digital libraries with foreign-language literature, particularly in engineering and technical fields.

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Under such conditions, foreign language training in technical higher education institutions in Ukraine will be effective and future specialists will be competitive not only in the domestic but also in the international labour markets.

Key words: foreign languages, foreign language training, technical higher education institutions, professional (technical) disciplines taught entirely/partially in English, Foreign Language, Foreign Language for Specific Purposes.

The statement of the issue. Technical specialists are in particular demand not only in Ukraine but also abroad. An integral component of their successful functioning in the modern labour market, in addition to special (professional, subject) competencies, are general (universal) competencies associated with the ability to establish productive communicative interaction, in particular, in foreign languages. This is because while performing their professional duties, they have to communicate with colleagues within working hours on various issues. They usually discuss prospective plans for enterprise development, its reconstruction and modernization; exchange ideas about the introduction of new equipment and technologies; high quality provision of services. They also coordinate work on patent and invention activities, standardization and unification, certification and rationalization of workplaces; prepare technical documentation (drawings, specifications, technical conditions, flow charts, etc.); interact with customers, project managers, specialists in technical operation, installation, adjustment, repair and modernisation of equipment and facilities, etc. Moreover, their communicative interaction should be implemented in oral and written forms, both face-to-face (during reports, conferences, presentations, discussions) and in real time, remotely using various technical means.

Thus, a foreign language is now an important and integral component of all stages of training highly qualified and competitive engineers and is carried out both as a part of the compulsory and optional components of the educational program. Modern trends show that fluency in a foreign language is the driving force that promotes career advancement, provides an opportunity to improve qualifications, do internships abroad, receive grants from international funds and partners, carry out lifelong learning, and quickly and easily adapt to an intercultural society. Foreign language training is focused on the transition from formal, factual knowledge to the acquisition of a purposeful, dynamic system of practical skills, meaningful actions and their application in real-life situations. Therefore, there is an urgent need to consider the problems and outline the prospects for the development of foreign language training in technical higher education institutions of Ukraine.

The analysis of relevant research. A significant contribution to the study of issues related to various aspects of foreign language training in technical higher education institutions of Ukraine has been made by I. Onysin "Teaching technical universities students to listen to a professionally oriented language (Stage III, English language)" (Kyiv, 1990); H. Kharlov "Fundamentals of systematic teaching of foreign language lexical material while reading texts in a non-linguistic university" (Odesa, 1991); V. Kudriashova "Methodology of teaching reading and translation of terminological phrases with a verb component in scientific and technical literature on communication (Technical University, English)" (Kyiv, 1993); O. Tarnopolskyi "Methodology of teaching English in the second year of a technical university" (Kyiv, 1993); N. Mulina "Methods of developing and using a distance learning course in English (Senior level in higher technical education institution)" (Kyiv, 2001); V. Titova "Modular-project methodology for teaching English to students of higher technical education institutions" (Kyiv, 2001); I. Kliuchkovska "Structuring the content of an integrative textbook on foreign languages for future specialists in engineering specialties" (Ternopil, 2006); Ya. Bulakhova "Pedagogical conditions for learning foreign languages of future software engineers by means of multimedia programs" (Luhansk, 2007); R. Hryshkova "Pedagogical basics of forming foreign language sociocultural competence of students of non-philological specialties in the process of professional training" (Poltava, 2007); T. Korzh "Teaching students of higher technical

education institutions to annotate English professionally-oriented texts" (Sevastopol, 2008); L. Bondar "Methods of teaching French professionally oriented monologue speech of students of technical specialties, taking into account their learning styles" (Kyiv, 2012); I. Sekret "Theoretical and methodological foundations of forming foreign language professional competence of students of higher technical education institutions in the conditions of distance education" (Kyiv, 2012); N. Sura "System of professional foreign language training of future specialists in information and communication technologies at technical universities" (Kyiv, 2013); O. Tarnopolskyi, Z. Kornieva "Commonly used Business English as a basis for the professionalization of English language learning for first-year students of economic and technical universities" (Chernihiv, 2013); N. Leniuk "The formation of German language competence of technical specialties students in the process of self-study work" (Ternopil, 2015); O. Nitenko "Foreign language training of law specialists in the three-cycle system of higher education: European experience" (Kyiv, 2015); Z. Kornieva "System of professionally oriented teaching English to students majoring in technology at tertiary schools" (Kyiv, 2018); O. Hrydzhuk "Theoretical and methodical principles of formation of language and communicative competence of future specialists in forest engineering specialties" (Kherson, 2018); Yu. Lavrysh "Didactic system of foreign language personalization for students majoring in engineering at technical universities" (Poltava, 2020); Ya. Necheporuk "Foreign language training in the history of domestic professional education development in flight training institutions in Ukraine (the second part of the 20th century – the beginning of the 21st century)" (Kropyvnytskyi, 2023) and others.

The purpose of the article is to characterize the problems and outline the prospects for the development of foreign language training in technical higher education institutions of Ukraine, taking into account advanced theoretical research and practical developments.

The body of the research. In the research process, the survey was conducted among students majoring in engineering, in particular, of Admiral Makarov National University of Shipbuilding, in order to identify their vision of the general state of foreign language training in higher technical education institutions. The analysis of the given answers has been represented below.

Answering the question "How satisfied are you with the number of hours of classroom and independent work per week (semester) in Foreign Language, Foreign Language for Specific Purposes and professional (technical) disciplines taught in English?", the majority of respondents (70.2 %) answered that they are not satisfied with the number of classroom hours for foreign language learning, which, in their opinion, is quite limited (usually two hours per week), but the number of hours for independent work is quite significant; moreover, it has been noted that few professional (technical) disciplines are taught in English, this mostly happens episodically/partially at the level of terminology; 15 % are generally satisfied with the number of hours for learning a foreign language; 14.8 % answered that it is difficult to answer.

When answering the question "How satisfied are you with the possibilities of obtaining additional knowledge of Foreign Language with the help of consultations, seminars and courses?" 5.3 % of respondents noted that it is hard to answer; 51.2 % – assessed the possibility of gaining fluency in a foreign language at the expense of consultations, seminars and courses as sufficient; 23.5 % – noted that they have a lack of free time due to being busy with professional disciplines to take extra classes; 20 % – stated that they have not considered such a possibility.

To the question "How would you rate the organizational, informational and consulting support for teaching Foreign Language, Foreign Language for Specific Purposes and professional (technical) disciplines taught in English?" 42.3 % of students answered that such support is sufficiently high, especially due to Internet telephony (Skype; Zoom; Telegram; Google Meet; Viber; WhatsApp); 33.5 % – determined, they did not consider this issue; 15.6 % – found out that it is sufficient to have regular (weekly) consultations; 8.6 % noted that they rarely ask for such support.

Answering the question "Are interdisciplinary connections used in the process of teaching Foreign Language for Specific Purposes?" 50.7 % of respondents gave a positive assessment of the observance of such connections; 34 % – answered that they can be traced; 25.3 % – determined that they have not considered this issue.

Answers to the question "Is the selection of content, methods and tools of learning and teaching Foreign Language reasonable and understandable for students?" are as follows: 22.4 % of respondents indicated that the selection of content, methods and tools of learning and teaching is reasonable and understandable, but they noted the lack of classroom hours for language learning; 9.1 % – pointed out that it is difficult for them to answer; 30.2 % – noted that they achieve good results due to the use of such methods as the case method (the method for analyzing specific professional situations), the method of business simulation games (the creation of real-life situation models of professional activity), the project method, cognitive maps during classroom classes and others; 38.3 % – indicated that they like learning foreign languages through the use of modern tools, including mobile applications, virtual reality tools, video games, video clips, flashcards, memes, short films, video fragments, electronic websites, electronic dictionaries under the guidance of a teacher, etc.

When answering the question "How satisfied are you with the innovation of Foreign Language teaching tools?", 48.1 % of respondents gave a positive answer; 32.7 % of students answered that the implementation of smart mobile applications, electronic dictionaries with 24-hour access, visual aids (or videograms), educational Internet websites, forums, etc. are successful; 19.2 % – noted that there is a lack of language classrooms, computer classrooms and interactive boards, etc..

Consequently, the results of the survey of applicants of the higher technical education institution regarding foreign language training have shown both negative and positive trends. As for the first, they include an insufficient number of classroom hours for foreign language learning and professional (technical) disciplines taught in English, a lack of technological equipment and devices. Regarding the second, it is the provision of advisory support in Foreign Language and Foreign Language for Specific Purposes, as well as professional (technical) disciplines taught in English through consultations, as well as Internet telephony tools (Skype, Zoom, Telegram, Google Meet, Viber and WhatsApp); the observance of interdisciplinary connections in the process of teaching Foreign Language for Specific Purposes; the involvement of mobile smart applications, electronic dictionaries with 24-hour access, video fragments, electronic websites, visual aids (or videograms), educational Internet sites, forums, etc.; the implementation in the educational process of such modern methods as: case method (method of analysis of specific professional situations), method of business simulation games (creation of real situations-models of professional activity), project method, etc.

Therefore, the results of the survey have proved the presence of a number of problems in students' foreign language training in higher technical education institutions of Ukraine. In support of the above, we cite the opinion of I. Zadorozhna that in most higher education institutions, there is a limited amount of classroom hours for students' foreign language training [1, p. 100]. Taking into account students' independent work, according to the scientist, is one of the ways to solve the established problem, since it is intended to intensify the process of foreign language learning to a certain extent. In addition, the researcher proposes the improvement of the system of integrated professional-oriented foreign language training of students of higher education institutions, taking into account the specifics of their further professional activities, requirements for specialists regarding the mastery of foreign languages, peculiarities of study in the relevant higher education institutions, age characteristics of students, market needs, which is rapidly changing, psycholinguistic features of foreign language learning [1, p. 100].

Z. Kornieva rightly notes that both teaching conditions and existing models of the organization of the educational process for mastering Foreign Language for Specific Purposes in technical higher education institutions do not allow students to fully develop their

professional communicative competence at the level B2 (Independent User) determined by program requirements after completing the bachelor's and C1 of the master's training course. She emphasizes that specialists of technical profiles acutely feel the need to improve their professional communicative competence after completing the university training course. Z. Kornieva underlines that there is an urgent need to revise the content of professional English language teaching, taking into account the inclusion of socio-cultural and psychological components into this content, and on the other hand, methods and techniques, namely the introduction of those types of educational activities that would simulate with maximum accuracy the real conditions of everyday communication of specialists in English [3, p. 58-59].

Considering the problems associated with the implementation of topics and situations of communication, O. Tarnopolskyi and M. Kabanova underline that they should reflect the basic content of foreign language communication in the language course as a whole [5, p. 125]. For non-language higher education institutions, this subject content must necessarily be very closely related to students' future specialty. Scientists draw attention to the fact that the issue of teaching a foreign language exclusively for professional communication should take into account the fact that during the first two years of study at non-linguistic universities, it is impossible to consider narrowly specific and complex special problems in a foreign language course, students do not have the necessary professional training for this [ibid.]. At the same time, O. Tarnopolskyi and M. Kabanova emphasize the need in the first years to study the most general and key problems of the specialty, and at a level closer to popular science than to purely scientific. But at the same time, in the language course it is necessary to provide a fairly systematic presentation of such general and key issues in their interconnection and interdependence. This will make it possible to create in students' minds a sufficiently complete and clear general idea of their future specialty and future work, an idea created by means of a foreign language [ibid.].

It should be noted that one of the steps towards solving the problems of students' professional foreign language training of technical institutions is the systematization of English language learning by intensifying and leveling students' language knowledge (with different levels from A1 to B2), eliminating gaps in initial courses with further strengthening its study at a more or less equal level.

This aspect is extremely important for students of engineering and technical specialties, who, as practical experience shows, have quite different basic (school) levels of foreign language training. It is desirable to determine the level of such training at the initial stage of university studies (the first month of the first year), and then the process of foreign language training can be intensified through differentiation and individualization of such training, through specialized additional courses, extracurricular foreign language study groups, in particular technical ones, etc.

In addition, O. Tarnopolskyi and M. Kabanova focus attention on the need to select typical authentic texts for the educational process [5, p. 127]. Researchers suggest that authentic textbooks on professional disciplines used in higher education institutions of English-speaking countries to train future specialists in a particular specialty as a source of selection of such texts for reading by students of non-linguistic higher education institutions. At the same time, the Internet (numerous professional websites) is considered to be the richest and most accessible source of selection of typical authentic professional texts. The advantage of this source also lies in the fact that there you can find sample texts not only for written, but also for oral speech. Also, the possibilities of the Internet for selecting authentic foreign-language written and oral texts intended for the educational process in language universities are almost unlimited [там само, p. 127].

Another important way to increase the level of competence of future specialists in foreign language training is the proposal to implement it by using interdisciplinary connections within the educational process. This makes it possible to form a scientific and technical outlook among students, to increase their level of motivation in acquiring new knowledge and skills.

Interdisciplinary connections contribute to a deeper understanding of new information. When solving professional tasks, the future specialist should be able to access changes in other areas of human activity. This, in our opinion, will allow future physicists to be more competitive in the labour market [9, p. 050015-2].

We believe that developing and compiling curricula for teaching English in a professional direction (including integrated ones) in close cooperation with teachers of professional technical disciplines, while including interdisciplinary connections, will give a positive result of foreign language training.

Delia Tanase and Pop Mirela-Christina quite rightly point out that the ever-increasing changes in the technically oriented labour market do not permit to precisely define the specific needs of future engineers. Therefore, scientists suggest avoiding the formulation of highly specialized competencies and focusing instead on general competencies of a particular field, as well as those that are useful regardless of the professional field in which the future engineer will work [10, p. 5632]. Modern high-quality foreign language training for specialists in technical higher education institutions is impossible without the use of modern learning technologies, which consist in the integration of digital tools and methods to improve the quality of education.

T. Sharhun, H. Bushko, Yu. Mosina focus on the fact that mastering foreign languages with the integration of modern Internet technologies into the educational process leads to its optimization (Fig. 1) [6, p. 207].

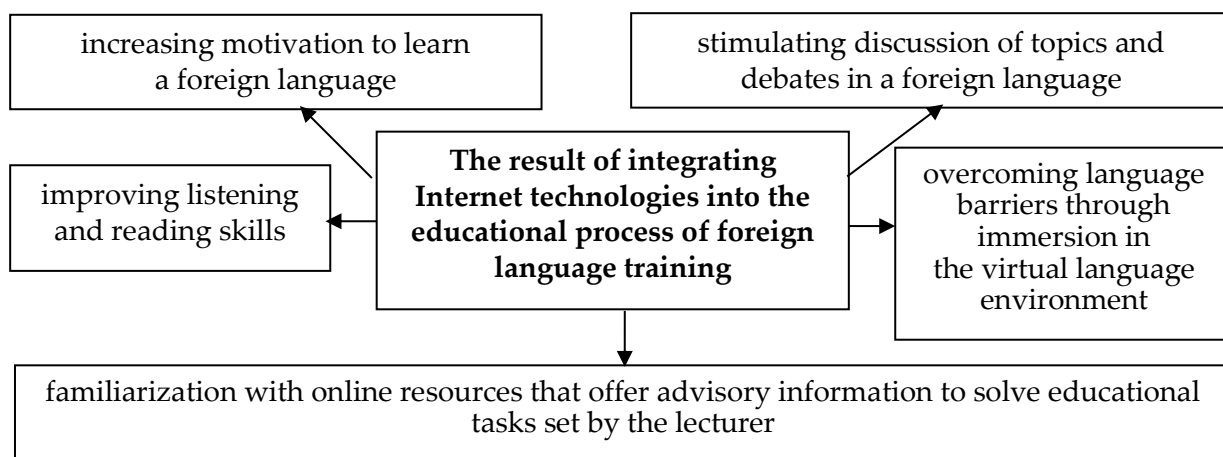


Fig. 1. The result of integrating Internet technologies into the educational process of foreign language training (according to T. Sharhun, H. Bushko, Yu. Mosina)

In particular, scientists note that "the use of modern educational technologies in higher education institutions plays a crucial role in improving the quality of education and the professional training of students" [11]. They suggest using such online platforms as Moodle, Coursera and others, which allow organizing the learning process in a virtual environment, as well as at a time convenient for students, viewing materials and receiving instant feedback; virtual reality (VR) and augmented reality (AR) technologies, which approve of creating interactive educational materials and learning simulations; interactive methods, such as interactive whiteboards, educational games and simulations, contribute to students' active involvement in the learning process; VR, AR, online platforms and other digital tools for completing practical tasks, projects and laboratory work [ibid.].

In addition, in the context of the digitalization of modern higher education, the involvement of information and communication technologies contributes to the development of key skills necessary for the successful adaptation of the individual in the new digital society [8].

For effective foreign language training, as L. Petko emphasizes, it is important to ensure the interaction of all components of the university's educational environment. The design of classrooms, corridors, recreational areas, as well as equipment should be well thought out: classroom boards, computers (each student in the study group in a practical lesson with IM is equipped with a computer), multimedia projectors, interactive boards (having a touch screen for displaying information and interacting with it, they allow you to project data from a computer, which you can work on directly from the board, for example, make various notes, launch applications and control the computer. This makes it possible to use the classroom and interactive whiteboard in parallel), projector screens, ergonomic furniture, as well as filling the classrooms with didactic and handout educational material [4, p. 119]. Expanding the capabilities of technical higher education institutions regarding foreign language training is also possible through the creation of modern computer classes, language labs, and university digital libraries with foreign language literature, in particular engineering and technical.

Conclusions. Therefore, taking into account the above, in the process of research, the prospects for the development of foreign language training in technical higher education institutions of Ukraine are classified as:

- the involvement of a foreign language component (English tasks) in students' production practice;
- the creation of a foreign-language local space in the conditions of a technical university with a coordinated subject-to-subject interaction and comprehensive disclosure of students' personal potential;
- the implementation of online and offline communicative interaction (correspondence, forums and round tables) with foreign technical partner universities;
- the development and compilation of curricula for teaching English in a professional direction (including integrated ones) in close cooperation with teachers of professional technical disciplines;
- the expansion of students' communicative potential by increasing classroom (contact) hours aimed at direct communicative interaction, in particular by including professionally oriented topics in educational laboratories and workshops;
- teaching academic and professional disciplines in English;
- the creation of English language education curricula with teaching all disciplines in English without exception;
- the systematization of English language learning by intensifying and leveling students' language knowledge (with different CEFR levels from A1 to B2), the elimination of gaps in initial courses with further strengthening its study at a more or less equal level by all students;
- the introduction of specialized additional courses, foreign language learning groups, in particular technical ones;
- the clear direction of foreign language training in accordance with the specifics of a particular engineering specialty;
- the integration of foreign language training with professionally oriented disciplines;
- the introduction of English weeks and days;
- the expansion of the capabilities of technical higher education institutions for students' foreign language training through the creation of modern computer classes, language rooms, and university digital libraries with foreign language literature, in particular engineering and technical.

Under such conditions, foreign language training in technical higher education institutions in Ukraine will be effective and future specialists will be competitive not only in the domestic but also in the international labour markets.

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ІНШОМОВНА ПІДГОТОВКА В ТЕХНІЧНИХ ЗАКЛАДАХ ВИЩОЇ ОСВІТИ УКРАЇНИ: ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ РОЗВИТКУ

У статті представлено перспективи розвитку навчання іноземних мов у вищих технічних закладах освіти України. Указано на важливості впровадження онлайн- та офлайн-комунікативної взаємодії між іноземними технічними університетами та партнерами.

Наголошено, що розширення комунікативного потенціалу студентів можливе через збільшення аудиторних (контактних) годин, спрямованих на безпосередню комунікативну взаємодію.

Акцентовано на розширенні комунікативного потенціалу здобувачів освіти через збільшення аудиторних (контактних) годин, спрямованих на безпосередню комунікативну взаємодію, зокрема із включенням професійноорієнтованої тематики в навчальних лабораторіях і майстернях.

Підкреслено важливість створення іншомовного локального простору в умовах технічного університету зі скоординованою суб'єкт-суб'єктною взаємодією та всебічним розкриттям особистісного потенціалу студентів.

Зазначено, що розроблення навчальних програм для викладання англійської мови за професійним спрямуванням (включаючи інтегровані) у тісній співпраці з викладачами професійноорієнтованих технічних дисциплін є одним із способів щодо інтенсифікації іншомовної підготовки.

Звернуто увагу на важливість підвищення можливостей вищих технічних закладів освіти щодо навчання іноземних мов через створення комп'ютерних класів, лінгафонних лабораторій та університетських цифрових бібліотек з літературою іноземними мовами, особливо інженерно-технічною.

Підсумовано, що лише за таких умов іншомовна підготовка в технічних закладах вищої освіти України буде ефективною, а майбутні фахівці – конкурентоспроможними не лише на вітчизняному, а й на міжнародному ринках праці.

Ключові слова: іноземні мови, іншомовна підготовка, вищі технічні навчальні заклади, професійні (технічні) дисципліни, що викладаються повністю / частково англійською мовою, іноземна мова, іноземна мова за фахом.

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STEAM-ТЕХНОЛОГІЇ ЯК ЗАСІБ ФОРМУВАННЯ ЦИФРОВИХ КОМПЕТЕНТНОСТЕЙ МАЙБУТНІХ ФАХІВЦІВ ІТ-СФЕРИ В УМОВАХ БЕЗПЕРЕРВНОЇ ПРОФЕСІЙНОЇ ОСВІТИ

У статті обґрунтовано роль STEAM-технологій як ефективного засобу формування цифрових компетентностей майбутніх фахівців ІТ-сфери в умовах безперервної професійної освіти. Актуальність дослідження зумовлена цифровізацією, розвитком штучного інтелекту й технологій Industry 4.0, що потребують від ІТ-фахівців не лише технічних, а й креативних, інженерних, аналітичних умінь. Підкреслено наявність суперечностей між вимогами ринку праці та традиційним змістом освіти, фрагментарністю впровадження цифрових технологій і недостатньою готовністю викладачів до STEAM-підходу.

Здійснено аналіз трактувань поняття «цифрова компетентність» у наукових джерелах і нормативних документах (концепція розвитку цифрових компетентностей, DigComp). Визначено її структуру: технічна (володіння цифровими інструментами), інформаційно-організаційна (пошук, аналіз, створення даних), комунікаційна (взаємодія, цифрова етика). Підкреслено, що формування цих компетентностей потребує інтегрованого, міждисциплінарного навчання, у якому поєднуються знання з природничих наук, ІКТ, інженерії, дизайну та математики.

Проаналізовано освітньо-професійну програму спеціальності 121 «Інженерія програмного забезпечення» ВСП «Фаховий коледж електронних приладів ІФНТУНГ». Установлено, що найбільш повно реалізовано компонент Technology (програмування, мережі, бази даних, кібербезпека), частково – Engineering, Science та Mathematics, компонент Arts представлений обмежено («Комп'ютерна графіка»), що зумовлює переважання STEM-моделі.

Зроблено висновок, що STEAM-підхід має значний потенціал для розвитку цифрових компетентностей майбутніх фахівців ІТ-сфери у професійних коледжах. Потребує посилення мистецько-дизайнерська складова, інтеграція проєктної діяльності, ШІ/ІХ, медіатехнологій та підвищення методичної підготовки викладачів.

Ключові слова: STEAM-освіта, цифрова компетентність, ІТ-фахівці, безперервна професійна освіта, інженерія програмного забезпечення, цифровізація, інформаційно-комунікаційні технології, освітньо-професійна програма, професійний коледж.