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education]. *Vocational and technical education*. No. 3. pp. 3–4. [in Ukrainian].

6. Stepko, M.F., Boliubash, Ya.Ia., Shynkaruk, V.D. and others. (2004). *Vyshcha osvita Ukrainy i Bolonskyi protses* [Higher education of Ukraine and the Bologna process]. *Education manual*. V.H. Kremen (Ed.). Ternopil, 384 p. [in Ukrainian].

7. Chernilevskiy, D.V., Hamretskiy, I.S., Zarichanskyi, O.A., Lutskiy, I.M. & Pshenychniuk, O.V. (2010). *Pedahohika vyshchoi shkoly* [Higher school pedagogy]. *Textbook*. (Ed.). D.V. Chernilevskiy. Vinnytsia, 408 p. [in Ukrainian].

8. Botkin, J.W., Elmadjra, M. & Malitz, M. (1979). *No Limits to Learning. A Report to the Club of Rome*. Oxford. pp. 25–30. [in English].

9. Yashchuk, S., Kolisnyk-Humeniuk, Y., Shapran, O., Martirosian, L., Petukhov, T. & Artemieva, I. (2021). Pedagogical Design of the Content of Professional Training of Teachers of General Technical Disciplines and Methods of Teaching Technology. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, No. 12 (1), pp. 278–299. [in English].

Стаття надійшла до редакції 02.10.2024

UDC 378.14

DOI: <https://doi.org/10.24919/2308-4634.2024.316502>

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The article is devoted to the study of the problem of professional communicative competence of IT specialists in a foreign language. The aim of the article is to analyse the research literature and study the foreign language professional communicative competence of IT specialists in the scientific and pedagogical discourse. It is determined that modern living conditions, characterized by intensive integration processes, intensification of international contacts and the destruction of territorial boundaries thanks to innovative digital technologies, have contributed to the improvement of the theory, methodology and practice of teaching foreign languages at the global level and at all levels of the educational system, in particular the professional one. IT business shows a tendency towards internationalization and globalization, which contributes to the emergence of many successful IT products thanks to the efforts of teams with representatives from different countries, regions and even continents in their structure. It is proved that communication is an integral component of the professional activity of IT specialists in today's conditions, the basis of meeting their professional communicative needs and the performance of professional duties and tasks. The main functional styles of professional communication in the IT sphere are determined and characterised. Based on the study of scientific publications, it is concluded that the foreign language professional communicative competence of IT specialists is the subject of scientific discussions. Scientific works emphasize its importance in the professional activity of IT specialists who cooperate and communicate at the level of the organization, country, and international level, and colleagues in the professional environment, partners, and clients are their communicators which substantiate the need to use language tools in order to achieve mutual understanding.

Keywords: *IT sphere; IT specialist; professional environment; communication; competence; communicative competence; professional communicative competence; foreign language professional communicative competence.*

Ref. 20.

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ІНШОМОВНА ПРОФЕСІЙНА КОМУНІКАТИВНА КОМПЕТЕНТНІСТЬ ІТ-ФАХІВЦІВ: НАУКОВО-ПЕДАГОГІЧНИЙ ДИСКУРС ПРОБЛЕМИ

Стаття присвячена дослідженню проблеми іншомовної професійної комунікативної компетентності ІТ фахівців. Визначено, що сучасні умови життя, які характеризуються інтенсивними інтеграційними процесами, інтенсифікацією міжнародних контактів та руйнуванням територіальних кордонів, завдяки інноваційним цифровим технологіям, сприяли вдосконаленню теорії, методики та практики навчання іноземних мов на

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глобальному рівні та на всіх рівнях освітньої системи, зокрема й професійної. IT-бізнес демонструє тенденцію до інтернаціоналізації та глобалізації, що сприяє появі багатьох успішних IT-продуктів, що створюються завдяки зусиллям команд, у складі яких є представники різних країн, регіонів і навіть континентів. Доведено, що спілкування (вербальне та невербальне, пряме та опосередковане), стилі (офіційно-діловий, офіційно-розмовний, науковий тощо), форми (усна та писемна) є невід'ємною складовою професійної діяльності IT-спеціалістів в сучасних умовах, основою задоволення їхніх професійних комунікативних потреб та виконання професійних обов'язків і завдань. Визначено та охарактеризовано основні функціональні стилі професійного спілкування в IT-сфері. На основі вивчення наукових публікацій зроблено висновок про те, що ініомовна професійна комунікативна компетентність IT-фахівців є предметом наукових дискусій. У наукових працях підкреслюється її важливість у професійній діяльності IT-фахівців, які співпрацюють і комунікують на рівні організації, країни та на міжнародному рівні, а колеги у професійному середовищі, партнери та клієнти є їх комунікаторами, що обґрунтовують потребу використовувати мовні засоби для досягнення взаєморозуміння.

Ключові слова: IT сфера; IT фахівець; професійне середовище; комунікація; компетентність; комунікативна компетентність; професійна комунікативна компетентність; ініомовна професійна комунікативна компетентність.

Problem statement. Modern living conditions, characterized by intensive integration processes, intensification of international contacts and the destruction of territorial boundaries thanks to innovative digital technologies, have contributed to the improvement of the theory, methodology and practice of teaching foreign languages at the global level and at all stages of the educational system, in particular the professional one. This is confirmed by the active search for new ideas and approaches to teaching foreign languages to future specialists in various fields of production and industry, including the IT sphere, in order to ensure their full preparation for successful professional communication in the conditions of the modern open world.

According to the statements of researchers [18], the IT business shows a tendency towards internationalization and globalization most clearly among all other sectors of the economy and production, which contributes to the emergence of many successful IT-products thanks to the efforts of teams with representatives from different countries, regions and even continents in their structure. The authors emphasize that the staff of modern successful IT companies includes professional employees of different nationalities, with various origins and places of residence, cultural and linguistic experience in order to create better products and services for international markets. Accordingly, the establishment of constructive interaction of employees based on their willingness to cooperate and communicate with representatives of different nationalities and cultures and speakers of diverse languages is the key to their productive functioning.

The analysis of recent research. It is worth mentioning that scientists study the problem of foreign language professional communicative competence of IT specialists from different perspectives: globalization changes and their impact on the competence requirements of modern IT specialists are studied O. Hurska [1], S. Ruda [7], A. Khomyk [11]. The problem of communicative culture development and foreign language communication skills is researched by O. Cher-

nyahovych [12]. Researchers emphasize the need to use English in the process of international cooperation and communication in IT sphere [20]. O. Synekop [9] accentuates the significance of foreign language knowledge in IT sphere. Communication and speech activity is analysed by L. Morska, J. Skibska, V. Sulym, V. Masztalir [16].

The analysis of the research problem justifies the need to summarize the research results.

The aim of the article is as follows: to analyse the research literature and study the foreign language professional communicative competence of IT specialists in the scientific and pedagogical discourse.

Research results. Taking into account globalization processes, O. Hurska emphasizes that global technological and communication changes in modern society cause "... the need to master a foreign language for the purpose of professional communication as one of the requirements for professional growth, formation and qualification of an IT specialist with a high level of professionalism, intellectual and creative abilities, sociability, professional mobility, the ability to operate with fundamental and general technical knowledge in the process of adaptation to the global information space" [1, 93]. The researcher considers mastery of foreign languages to be a prerequisite for solving a wide range of professional tasks in the conditions of the current open IT market.

S. Ruda [7] also claims that the significant expansion of international cooperation with the involvement of a wide variety of information and communication technologies requires a modern specialist in the IT industry to master foreign languages at a qualitatively new level, which would allow not only to navigate freely in the current society to satisfy his cognitive, social, cultural, communicative needs, but also to successfully perform their professional functions and duties. In such conditions, mastering foreign languages, in her opinion, should be considered an integrated component of the complex process of training future IT specialists for professional activities in today's open and multilingual world.

We observe similar considerations in the research of A. Khomyk: "Today, in the conditions of rapid global development of technologies, the problem of improving the foreign language training of future information technology specialists is becoming especially urgent, because the specificity of professionally oriented communication of these specialists involves communication with colleagues and clients from all over the world. Future information technology professionals must have knowledge, skills and abilities that will allow them to communicate on a global scale, using English as a language of global communication and a means of professional interaction" [11, 17].

O. Chernyahovych also emphasizes the importance of the development of communicative culture and foreign language communication skills: "In addition to stable knowledge and skills in solving professional problems, quite often knowledge of the basics of professional communication becomes decisive in situations of public speaking, discussion, negotiations, meetings, and solving production issues and provision of consulting and other services. Therefore, the training of future specialists in computer and software engineering ... should include the formation of readiness to communicate in both native and foreign languages in professional activities and professional environment" [12, 348].

Scientists consider the realities of professional practice in the course of substantiating the importance of learning English as a foreign language for future IT professionals. IT professions, in their opinion, can hardly be classified as social, which involve active, frequent, long-term communication with a wide range of people [20]. At the same time, scientists emphasize such a feature of it as working in a team, mostly international, given the complexity and high labour-intensiveness of the processes of developing high-quality software products. Therefore, scientists rightly identify English as the language of international communication and a kind of key to success in the professional activity of an IT specialist in the current conditions of its intensive globalization and internationalization.

V. Osadchyi and S. Symonenko prove the importance of foreign language training of IT specialists through the lens of current employer requirements. In particular, their analysis of online job databases showed that among the requirements of IT companies for an applicant, in addition to professional knowledge, abilities, skills and work experience, an appropriate level of foreign language proficiency occupies a prominent place. In particular, in their requirements for the candidate, they indicate the need for: knowledge of a foreign language with a clear indication of the level (pre-intermediate, intermediate, upper-intermediate), knowledge of a technical foreign language, the ability to read and translate technical literature and documentation, knowledge of a spoken language for

communication with foreign clients, as well as knowledge of the basics of written correspondence for electronic communication [6, 41].

From the above considerations, it is noticeable that, justifying the importance of mastering foreign languages for IT specialists, the above-mentioned scientists appeal primarily to the modern realities of their professional practice, which involves active professional communication within the globalized professional environment. They consider communication an integral component of the professional activity of IT specialists in today's conditions, the basis of meeting their professional communicative needs and the performance of professional duties and tasks. Professionally oriented communication among IT specialists, according to their reasoning, involves first of all ensuring the active exchange of relevant professional information, establishing a comfortable work atmosphere for everyone, establishing partnership relations between colleagues, etc.

We find the same ideas in the study of O. Synekop, who proves the significance of foreign language knowledge in the context of the specifics of the IT specialist's activities. In particular, the author points to a wide range of social and professional roles of employees of IT companies, differentiated by specific areas of activity: development, testing, management, support, analytics. The researcher emphasizes that performance of one or another role, such as: programmer, system analyst, tester, information security specialist, system administrator, etc. necessarily involves the exchange of professional information, experience, and knowledge. These roles focus not only on the performance of certain functions by the IT specialist in production, but also on the appropriate communicative behaviour, which requires thorough knowledge and skills in foreign languages [9, 145].

N. Dobrovolska notes that modern working conditions and professional tasks of an IT specialist require the ability to understand professional texts, the readiness to present software products and discuss them with clients and colleagues, the ability to communicate freely with representatives of foreign IT companies and participate in international conferences and symposia, the ability to carry out a comprehensive analysis and critical evaluation of technical solutions and products by means of a foreign language [2, 20]. At the same time, the researcher rightly emphasizes the need for a detailed study of the peculiarities of foreign language professionally oriented communication of IT specialists in order to determine constructive approaches to learning foreign languages and justify the key requirements for their foreign language knowledge and skills, taking into account the immediate realities of their professional activities.

In our opinion, D. Filonenko emphasizes the communicative orientation of the professional activity of IT specialists in a particularly apt way: "Since the

field of professional activity of IT specialists lies in the field of collection, processing, storage, transmission and methods of obtaining information, organization of information transmission channels, modern means and methods of information protection in global and local networks, it can be said that all types of professional activity have a communicative character” [10, 38]. According to the author, the formation of IT specialists’ ability to professional and communicative activity requires an organic combination of various aspects covering all aspects of professional communication in the IT environment. In particular, it indicates the cognitive aspect, which is manifested in the knowledge of specific means and methods of professional communication among IT specialists, the interactive aspect, which is embodied in the skills of organizing the mutual exchange of information between IT specialists, and the perceptive aspect, which is reflected in the awareness of peculiarities, norms, rules of communication with different categories of employees and clients of the IT industry.

The specific features of foreign language professional communication of IT specialists are also presented in the study of scholars [19]. The scientists paid special attention, first of all, to determining their motivation for foreign language communicative activity, which is caused by interest in global innovations in the professional sphere, the need to exchange work experience with foreign colleagues, the need to prepare reviews and recommendations for software products, requests to participate in international projects, etc. The results of their research indicate the need for IT specialists to be prepared for foreign language communication in various forms, in particular oral, which allows for quick feedback with colleagues or customers of IT services, and written, which provides the possibility of preparing production documentation or professional electronic correspondence.

In addition to the importance of the formation of foreign language knowledge and skills of IT specialists in terms of various forms of their professional communication, researchers [16] note the need to take into account different types of speech activity, which form the basis of their professional communication, namely monologue and dialogue. Thus, a monologue within the professional communication of IT specialists involves a clear, logically structured statement for the purpose of conveying professional information or persuading colleagues or consumers of IT services regarding certain technological solutions. Its content is always aimed at reflecting a real situation or problem of professional activity in the IT industry, and its function is at informing, motivating or persuading interlocutors. Instead, the dialogue, according to the interpretations of scientists, is based on the direct exchange of professional information between two or more specialists for the purpose of discussing a respective professional

problem. It is aimed at the exchange of proposals, opinions regarding the solutions of a certain professional task based on the interactive activity of at least two communicators. Therefore, scientists call for the need for the formation of foreign language knowledge and skills of IT specialists within the limits of both dialogic and monologic foreign language communicative activities in accordance with the requirements of their professional activities.

In this context, we cannot ignore the research on the problem of the formation of foreign language knowledge and skills of IT specialists in terms of different styles of their professional communication [13]. In particular, scientists identify compositional structures, stylistic and genre features, which are typical, first of all, for professional communication in the IT environment. They emphasize that the most characteristic functional styles in the communication of IT specialists are as follows: 1) official-business, which normalizes the compilation and design of business documentation; 2) scientific, which ensures the presentation of new data in academic texts or discussions; 3) journalistic, which involves the presentation of professional information in a popular, accessible non-specialist form. These styles, in their opinion, are realized primarily in such genres as report, theses, abstract, instruction, application letter, information security policy, etc., the preparation of which requires proper foreign language skills of IT specialists.

The conclusions of scientists [8] regarding the specific features of the professional IT discourse, which determine the nature of the foreign language professional communicative activity of specialists in the relevant field, are also important within the scope of our research. In particular, according to their statements, it is characterized by a reasoned presentation of professional information, strict adherence to the sequence of data presentation for informing, explaining or persuading, logical connections between all elements of the statement. These features ensure the accuracy, clarity, objectivity, accessibility, logic, and persuasiveness of the statements of IT specialists in the process of professional foreign language communication, and therefore require special attention in the process of learning foreign languages according to the relevant professional direction.

A number of researchers [15] connect the specifics of professional speech in the field of IT primarily with the wide use of professional terminology, the use of words and phrases that reflect the essential features of this professional activity, and therefore focuses primarily on the problem of forming lexical knowledge and skills in the process of learning foreign languages and its personnel support. In their research, scientists offer specific lists of units, in particular, English as a foreign language, which must be mastered by IT specialists for successful professional communication.

They contain, for example, units for designating the components of a computer, the basics of their construction, ways of working with it, or the names of software products, files, commands, etc., without knowledge of which it is impossible to decode or construct statements in a foreign language on professional topics.

In this context, the results of Kizil's [3] study, devoted to the identification of the peculiarities of the IT sphere terminology system, are of great significance, considering which is an important prerequisite for the effective training of IT specialists for successful professional foreign language communication. The author defines these features using the example of the English language, the mastery of which is considered one of the key attributes of a highly qualified IT specialist. In particular, the researcher points out the prevalence of synonyms, antonyms, evaluative and expressive connotations of terms, metaphorical and metonymic nominations, phraseological expressions in the professional lexicon of the IT industry, the knowledge and understanding of which is the key to the correct perception of professional information or the construction of professional messages. In addition, the author notes the prevalence of formal signs-symbols and alphanumeric abbreviations in the terminology system of the IT sphere, the mastery of which requires additional attention during the training of future IT specialists in English as a language of foreign professional communication.

From the standpoint of the functions of professional foreign language communication of IT specialists, scholars suggest determining the essence of their foreign language professional communicative competence [17]. The authors correlate the foreign language communicative competence of IT specialists primarily with the ability to implement a wide range of professionally oriented communication tasks, including informative, regulatory, emotional-evaluative, interactive-etiquette, etc. Therefore, researchers see its essence in the system of knowledge, skills, and abilities necessary to achieve the corresponding goals of professionally oriented foreign language communication, taking into account all its types (verbal and non-verbal, direct and indirect), styles (official-business, official-conversational, scientific, etc.), forms (oral and written).

The authors of the study propose to consider the structure of foreign language communicative competence of IT specialists primarily as a wide repertoire of speech actions that make it possible to realize various communicative requests, intentions, and needs in the process of professional activity. These actions include, for example: asking, reporting, explaining, perceiving, understanding professional information; prompting to make certain decisions in the course of professional activity and responding to the proposals of

others; expressing one's own opinion on a certain professional problem with clear arguments; expressing agreement/disagreement with the position of other interlocutors according to generally accepted norms of communication, etc. [17].

The considerations of I. Semeryak regarding the essence and structure of foreign language communicative competence of IT specialists are important within the scope of our research. In particular, we are impressed by the researcher's approach to the characterization of the professional foreign language communicative competence of IT specialists as an integrative personal and professional quality, which is manifested in "... a combination of linguistic, sociolinguistic, branch and subject professional knowledge, skills, abilities, the ability to successfully implement communicative acts of a professional nature in a foreign language and achieve a communicative goal" [8, 17]. In addition, the author rightly emphasizes the importance of motivational factors and the general experience of the communicative activity of IT specialists in the structure of their professionally oriented foreign language communicative competence, and therefore points to its key characteristics, such as multi-component, multi-level, hierarchical.

In view of this interpretation of the essence of the foreign language professional communicative competence of IT specialists, the author singles out the following components: 1) linguistic which comprises the totality of knowledge about the foreign language system; 2) sociolinguistic – the awareness of the peculiarities of foreign language functioning in various social contexts; 4) functional – the ability to implement professional and communicative tasks by means of a foreign language; 3) discursive – mastering the norms of verbal and non-verbal communication in the process of foreign language communication; 5) strategic – the ability to achieve communicative goals with the help of strategies that compensate for the insufficient formation of linguistic, sociolinguistic, discursive or functional components [8].

Conclusions and prospects for further research.

Based on the study of scientific publications, we conclude that the foreign language professional communicative competence of IT specialists is the subject of scientific discussions. Scientific works emphasize its importance in the professional activity of IT specialists who cooperate and communicate at the level of the organization, country, and at the international level, and colleagues in the professional environment, partners, and clients are their communicators which substantiate the need to use language tools in order to achieve mutual understanding.

ЛІТЕРАТУРА

1. Гурська О.О. Формування професійно важливих якостей майбутніх фахівців з інформаційних технологій в

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освітньому середовищі технічного університету: дис. ... канд. пед. наук: 13.00.04. Київ: Національний авіаційний університет. 2020. 320 с.

2. Добровольська Н.Л. Формування в майбутніх фахівців з інформаційних технологій англomовної компетентності в читанні та говорінні: дис. док. філос. наук: спеціальність: 011. Тернопіль: Тернопільський національний педагогічний університет імені В. Гнатюка. 2021. 290 с.

3. Кізиль М.А. Структурно-семантичні та соціофункціональні параметри метатерміносистеми англійської мови сфери комп'ютерних технологій: дис. ... канд. філ. н.: спеціальність: 10.02.04. Запоріжжя: Запорізький національний університет. 2016. 298 с.

4. Мукан Н., Горохівська Т., Ієвлев О., Чубінська Н., Кобрин В. Іншомовна комунікативна компетентність: поняттєво-категорійний дискурс. *Академічні візії*. 2023. № 15. URL: <https://academy-vision.org/index.php/av/article/view/738>

5. Мукан Н., Горохівська Т., Ієвлев О., Чубінська Н., Кобрин В. Формування іншомовної комунікативної компетентності фахівця (досвід Національного університету "Львівська політехніка"). *Академічні візії*, 25. 2023. URL: <https://academy-vision.org/index.php/av/article/view/737>

6. Осадчий В.В., Симоненко С.В. Іноземна мова як засіб формування комунікативної компетентності майбутніх інженерів-програмістів. *Інформаційні технології і засоби навчання*. 2017. № 58 (2). С. 38–48.

7. Руда С.В. Інформаційні технології як засіб розвитку комунікативних навичок. *Науковий часопис НПУ імені М. П. Драгоманова*. 2011. № 5. С. 230–234.

8. Семеряк І.З. Соціокогнітивний підхід до формування стратегій іншомовного професійно орієнтованого спілкування майбутніх програмістів з використання Інтернету: автореф. дис. ... канд. пед. наук: 13.00.02. Тернопіль: Тернопільський національний педагогічний університет імені В. Гнатюка. 2016. 23 с.

9. Синєкоп О.С. Теорія і практика диференційованого навчання професійно орієнтованого англomовного спілкування майбутніх фахівців з інформаційних технологій: дис. ... док. пед. наук: 13.00.02. Київ: Київський національний лінгвістичний університет. 2022. 720 с.

10. Філоненко Д.В. Особливості формування професійної комунікативної компетентності та часові перспективи при підготовці ІТ-спеціалістів. *Науковий вісник Херсонського державного університету. Серія: Психологічні науки*. 2019. Вип. 4. С. 37–44.

11. Хомик А.Ю. Формування стратегічної компетентності в професійно орієнтованому усному англomовному спілкуванні майбутніх фахівців з інформаційних технологій: дис. ... док. філос. наук: 011. Тернопіль: Тернопільський національний педагогічний університет імені В. Гнатюка. 2022. 290 с.

12. Черняхів О.С. Змістові та структурні особливості готовності до професійного іншомовного спілкування майбутніх фахівців з комп'ютерної та програмної інженерії (теоретичний аспект). *Педагогічні науки: теорія, історія, інноваційні технології*. 2010. № 8(10). С. 347–354.

13. Assyne N., Ghanbari H., Pulkkinen M. The essential competencies of software professionals: A unified competence framework. *Information and Software Technology*. 2022. № 151. P. 1–20.

14. Balaei P., Ahour T. Information Technology Students' Language Needs for their ESP Course. *International Journal*

of Applied Linguistics & English Literature. 2018. № 7(2). P. 197–203.

15. Groeneveld W., Vennekens J., Aerts K. Identifying non-technical skill gaps in software engineering education: What experts expect but students don't learn. *Transactions on Computing Education*. 2021. № 22(1). P. 1–21.

16. Morska L.I., Skibska J., Sulym V.T., Masztalir V.V. Didactic potential of the integrated approach to teaching future programmers professional communicative competence in a foreign language. *Information Technologies and Learning Tools*. 2018. № 64(2). P. 1–12.

17. Niva A., Markkula J., Annanperä E. Junior software engineers' international communication and collaboration competences. *IEEE Access*. 2023. № 11. P. 39–68.

18. Rajprasit K., Hemchua S. The English language & communication in the international workplace: An examination of Thai computer engineering professionals. *3L, Language, Linguistics, Literature*. 2015. № 21(3). P. 109–124.

19. Shuppe L., Koval V., Sotska H., Trynus O., Melnyk A. Communicative competence of future specialists in the information and digital educational environment. *Amazonia Investiga*. 2024. № 13(77). P. 188–200.

20. Symonenko S.V., Zaitseva N.V., Osadchyi V.V. Communicative patterns for IT professionals as means of mastering communication skills. *Journal of Physics: Conference Series*. 2021. № 1946. P. 1–11.

REFERENCES

1. Hurska, O.O. (2020). Formuvannya profesiino vazhlyvykh yakosteï maibutnikh fakhivtsiv z informatsiinykh tekhnolohii v osvithnomu sere dovys hchi tekhnichnoho universytetu [The formation of professionally important qualities of future information technology specialists in the educational environment of a technical university]. *Candidate's thesis*. Kyiv, 320 p. [in Ukrainian].

2. Dobrovolska, N.L. (2021). Formuvannya v maibutnikh fakhivtsiv z informatsiinykh tekhnolohii anhlo m ovnoi kompetentnosti v chytanni ta hovorinni [The formation of future information technology specialists in English language competence in reading and speaking]. Ternopil, 290 p. [in Ukrainian].

3. Kizil, M.A. (2016). Strukturno-semantychni ta sotsio-funktsionalni parametry metaterminosystemy anhliiskoi movy sfery kompiuternykh tekhnolohii [Structural-semantic and socio-functional parameters of the meta-terminological system of the English language in the field of computer technologies]. *Candidate's thesis*. Zaporizhzhia, 298 p. [in Ukrainian].

4. Mukan, N., Horokhivska, T., Iievliev, O., Chubinska, N. & Kobryn, V. (2023). Inshomovna komunikatyvna kompetentnist: poniattievo-katehoriinyi dyskurs [Foreign language communicative competence: conceptual and categorical discourse]. *Academic visions*. No. 15. Available at: <https://academy-vision.org/index.php/av/article/view/738> [in Ukrainian].

5. Mukan, N., Horokhivska, T., Iievliev, O., Chubinska, N. & Kobryn, V. (2023). Formuvannya inshomovnoi komunikatyvnoi kompetentnosti fakhivtsia (dosvid Natsionalnoho universytetu "Lvivska politekhnika") [The formation of foreign language communicative competence of a specialist (experience of Lviv Polytechnic National University)]. *Academic Visions*. No. 25. Available at: <https://academy-vision.org/index.php/av/article/view/737> [in Ukrainian].

6. Osadchyi, V.V. & Symonenko, S.V. (2017). Inozemna mova yak zasib formuvannya komunikatyvnoi kompetentnosti

maibutnikh inzheneriv-prohramistiv [Foreign language as a means of forming communicative competence of future software engineers]. *Information technologies and teaching tools*. No. 58 (2). pp. 38–48. [in Ukrainian].

7. Ruda, S.V. (2011). Informatsiini tekhnolohii yak zasib rozvytku komunikatyvnykh navychok [Information technologies as a means of developing communication skills]. *Scientific journal of the M. P. Drahomanov NPU*. No. 5. pp. 230–234. [in Ukrainian].

8. Semeriak, I.Z. (2016). Sotsiokohntyvnyi pidkhid do formuvannya stratehii inshomovnoho profesiino oriietovanoho spilkuvannya maibutnikh prohramistiv z vykorystannia Internetu [Socio-cognitive approach to the formation of strategies for foreign language professionally oriented communication of future programmers on the use of the Internet]. *Extended abstract of candidate's thesis*. Ternopil, 23 p. [in Ukrainian].

9. Synekop, O.S. (2022). Teoriia i praktyka dyferentsiiovanoho navchannya profesiino oriietovanoho anhlomovnoho spilkuvannya maibutnikh fakhivtsiv z informatsiinykh tekhnolohii [Theory and practice of differentiated training of professionally oriented English-language communication of future specialists in information technologies]. *Doctor's thesis*. Kyiv, 720 p. [in Ukrainian].

10. Filonenko, D.V. (2019). Osoblyvosti formuvannya profesiinoi komunikatyvnoi kompetentnosti ta chasovi perspektyvy pry pidhotovtsi IT-spetsialistiv [The peculiarities of the formation of professional communicative competence and time perspectives in the training of IT specialists]. *Scientific Bulletin of Kherson State University. Series: Psychological sciences*. Vol. 4. pp. 37–44. [in Ukrainian].

11. Khomyk, A.Yu. (2022). Formuvannya stratehichnoi kompetentnosti v profesiino oriietovanomu usnomu anhlomovnomu spilkuvanni maibutnikh fakhivtsiv z informatsiinykh tekhnolohii [The formation of strategic competence in professionally oriented oral English communication of future information technology specialists]. *Doctor's thesis*. Ternopil, 290 p. [in Ukrainian].

12. Cherniakhovych, O.S. (2010). Zmistovi ta strukturni osoblyvosti hotovnosti do profesiinoho inshomovnoho spilkuvannya maibutnikh fakhivtsiv z kompiuternoї ta prohramnoi inzhenerii (teoretychnyi aspekt) [Content and struc-

tural features of readiness for professional foreign language communication of future specialists in computer and software engineering (theoretical aspect)]. *Pedagogical sciences: theory, history, innovative technologies*. No. 8 (10). pp. 347–354. [in Ukrainian].

13. Assyne, N., Ghanbari, H. & Pulkkinen, M. (2022). The essential competencies of software professionals: A unified competence framework. *Information and Software Technology*. No. 151. pp. 1–20. [in English].

14. Balaei, P. & Hour, T. (2018). Information Technology Students' Language Needs for their ESP Course. *International Journal of Applied Linguistics & English Literature*. No. 7(2). pp. 197–203. [in English].

15. Groeneveld, W., Vennekens, J. & Aerts, K. (2021). Identifying non-technical skill gaps in software engineering education: What experts expect but students don't learn. *Transactions on Computing Education*. No. 22(1). pp. 1–21. [in English].

16. Morska, L.I., Skibska, J., Sulym, V.T. & Masztalir, V.V. (2018). Didactic potential of the integrated approach to teaching future programmers professional communicative competence in a foreign language. *Information Technologies and Learning Tools*. No. 64 (2). pp. 1–12. [in English].

17. Niva, A., Markkula, J. & Annanperä, E. (2023). Junior software engineers' international communication and collaboration competences. *IEEE Access*. No. 11. pp. 39–68. [in English].

18. Rajprasit, K. & Hemchua, S. (2015). The English language & communication in the international workplace: An examination of Thai computer engineering professionals. *3L, Language, Linguistics, Literature*. No. 21(3). pp. 109–124. [in English].

19. Shuppe, L., Koval, V., Sotska, H., Trynus, O. & Melnyk, A. (2024). Communicative competence of future specialists in the information and digital educational environment. *Amazonia Investiga*. No. 13(77). pp. 188–200. [in English].

20. Symonenko, S.V., Zaitseva, N.V. & Osadchyi, V.V. (2021). Communicative patterns for IT professionals as means of mastering communication skills. *Journal of Physics: Conference Series*. No. 1946. pp. 1–11. [in English].

Стаття надійшла до редакції 09.10.2024



“Якщо Ви по-справжньому вірите в те, що робите, не дозволяйте ніяким обставинам стримувати Вас. Кращі в світі досягнення стали можливими не “ЗАВДЯКМ”, а “ВСУПІЕРЕЧ”.
Головне – робити свою справу”.

Дейл Карнегі
американський педагог

“Уміння ставити розумні запитання вже є важлива і необхідна ознака розуму і проникливості”.

Іммануїл Кант
німецький філософ

