

DOI: <https://doi.org/10.32820/2074-8922-2024-82-85-92>

УДК 378.147:811

**COMMUNICATIVE COACHING AS A MEANS OF DEVELOPING FUTURE ENGINEERS'
FOREIGN LANGUAGE COMMUNICATIVE COMPETENCE**© **O. Bryntseva, A. Podorozhna***Ukrainian Engineering Pedagogics Academy***Information about author:**

Olena Bryntseva: ORCID: 0000-0002-2354-7901; elenabrynceva2@gmail.com; Senior lecturer of the Department of Foreign Language Training, European Integration and International Cooperation, Ukrainian Engineering Pedagogics Academy, 16 Universitetska st., Kharkiv, 61003, Ukraine

Alina Podorozhna: ORCID: 0000-0001-5248-7699; podorozhnik79@gmail.com; Senior lecturer of the Department of Foreign Language Training, European Integration and International Cooperation, Ukrainian Engineering Pedagogics Academy, 16 Universitetska st., Kharkiv, 61003, Ukraine

In the context of economic and business globalization, the expansion of opportunities to enhance professional competencies is crucial. One of the key factors contributing to this is the internationalization of modern engineering education. The article emphasizes the importance of social and humanitarian skills, including foreign language communicative competence. These competencies are reflected in the quality criteria of engineering education, established by international councils and organizations that accredit educational programs of engineering universities and certify the level of training of their graduates. Incorporating communicative coaching into engineering education not only enables students to enhance their technical skills, but also empowers them to effectively communicate across cultural and linguistic boundaries. This approach empowers future engineering specialists to not only excel in their technical fields but also navigate the intricacies of a globalized workforce. The authors argue that communicative coaching is an effective method for developing foreign language communicative competence in future engineering specialists.

The authors thoroughly analyze this coaching method from the standpoint of modern and innovative educational tools, which seamlessly incorporate the principles of contextual learning into a professionally focused educational setting. Training technologies are developed based on key principles of game modeling, which include the use of effective exercises, creating associations, encouraging communication, and achieving desired outcomes. This approach strikes a balance by incorporating both traditional and innovative simulation teaching methods. Taking into account the specifics of engineering activity and the list of professionally important qualities necessary for the future engineer to ensure effective professional interaction and develop the culture of professional communication, the authors conclude in the article that it is advisable to combine and use elements of communicative training, socio-psychological and practical-professional training for this purpose. The application of professional-communicative coaching in universities, which provides the development of professionally important qualities and the implementation of integrative content in the professional training of future engineers, is aimed at the formation of future specialists' volitional qualities, communicative tolerance, empathy, communicative and organizational aptitudes, self-regulation and communicative control. Through the integration of communicative training, socio-psychological training, and practical-professional training, professional-communicative coaching in universities fosters the development of crucial qualities in future engineers. These qualities encompass volition, communicative tolerance, empathy, as well as communicative and organizational aptitudes, resulting in enhanced self-regulation and communicative control for aspiring specialists. Ultimately, the objective is to shape a profound culture of professional communication and promote effective professional interaction among future engineers.

Keywords: future engineer, communicative coaching, professionally important qualities, teaching technology, interactive teaching methods.

O. Бринцева, А. Подорожна. «Комунікативний тренінг як засіб розвитку іншомовної комунікативної компетенції майбутніх інженерів».

В умовах глобалізації економіки та бізнесу розширення можливостей для підвищення професійних компетенцій має вирішальне значення. Одним із ключових факторів, що сприяє цьому, є інтернаціоналізація сучасної інженерної освіти. У статті підкреслюється важливість соціально-гуманітарних навичок, зокрема іншомовної комунікативної компетентності. Ці компетенції відображені в критеріях якості інженерної освіти, встановлених міжнародними радами та

організаціями, які акредитують освітні програми інженерних університетів та засвідчують рівень підготовки їх випускників. Впровадження комунікативного тренінгу в інженерну освіту дозволяє студентам не лише вдосконалити свої технічні навички, але й навчитись ефективно спілкуватись, незважаючи на культурні та мовні бар'єри. Такий підхід дає змогу майбутнім інженерам не лише досягати успіху у своїх технічних галузях, але й орієнтуватися в тонкощах глобалізованої робочої сили. Автори стверджують, що комунікативний коучинг є ефективним методом розвитку іншомовної комунікативної компетентності у майбутніх фахівців інженерних спеціальностей.

Автори ґрунтовно аналізують метод коучингу з точки зору сучасних інноваційних освітніх інструментів, які органічно включають принципи контекстного навчання у професійно-орієнтоване освітнє середовище. Тренінгові технології розроблені на основі ключових принципів ігрового моделювання, які включають використання ефективних вправ, створення асоціацій, заохочення комунікації та досягнення бажаних результатів. Такий підхід забезпечує баланс між традиційними та інноваційними стимуляційними методами навчання. Враховуючи специфіку інженерної діяльності та перелік важливих професійних якостей, необхідних майбутньому інженеру для забезпечення ефективної професійної взаємодії та розвитку культури професійного спілкування, автори статті доходять висновку, що з цією метою доцільно поєднувати та використовувати елементи комунікативного тренінгу, соціально-психологічної та практично-професійної підготовки. Застосування професійно-комунікативного коучингу у ЗВО, який забезпечує розвиток професійно-важливих якостей та реалізацію інтегрованого змісту у професійній підготовці майбутніх інженерів, спрямоване на формування у майбутніх фахівців волевих якостей, комунікативної толерантності, емпатії, комунікативних та організаторських здібностей, саморегуляції та комунікативного контролю. Завдяки інтеграції комунікативного тренінгу, соціально-психологічного тренінгу та практично-професійної підготовки, професійно-комунікативний коучинг у ЗВО сприяє розвитку у майбутніх інженерів важливих якостей. Ці якості охоплюють волю, комунікативну толерантність, емпатію, а також комунікативні та організаторські здібності, що сприяють підвищенню саморегуляції та комунікативного контролю у майбутніх фахівців. Зрештою, метою є формування глибокої культури професійного спілкування та сприяння ефективній професійній взаємодії майбутніх інженерів.

Ключові слова: майбутній інженер, комунікативний тренінг, професійно важливі якості, технологія навчання, інтерактивні методи навчання.

Problem Statement. The higher professional education system in Ukraine is currently facing several significant challenges, including the need to accommodate an increasing number of students, higher quality standards for education and research, the transition to flexible competence-oriented programs, the emergence of new educational formats, changing educational technologies, and the internationalization of higher professional education.

In the current global economy and business environment, the internationalization of modern engineering education plays a crucial role in expanding opportunities to enhance professional competencies. In the context of economic and business globalization, the internationalization of modern engineering education plays a crucial role in expanding opportunities to enhance professional competencies. To achieve these objectives, engineering universities need to implement various strategies and initiatives. This can involve establishing partnerships and collaborations with international institutions, promoting student and faculty exchanges, organizing international conferences and

workshops, and integrating global perspectives into the curriculum. By embracing internationalization, engineering universities can foster a diverse and inclusive learning environment that prepares students to excel in a globalized world. This approach also fosters innovation and encourages research collaboration on an international scale.

One of the key tasks for an engineering university aiming to become a world-class institution is to actively participate in international activities. By doing so, the university can achieve a multitude of results, including the following: enhancing the university's position in global rankings, thereby gaining international recognition for its excellence; establishing a solid reputation for the university's scientific research and advancements on an international level; immerse the university in a modern technological environment, ensuring access to the latest knowledge and advancements in scientific research; cultivating adaptability among students and faculty, enabling them to thrive in diverse cultural and environmental conditions; expanding horizons and fostering the emergence of new

scientific and personal objectives, while developing a global perspective; facilitating participation in international teams and projects, fostering collaboration and innovation on a global scale; increasing the number of publications in foreign languages, thereby disseminating research findings to a wider international audience; promoting participation in academic mobility programs, allowing students to gain valuable international experiences and perspectives.

By actively pursuing international activities, an engineering university can position itself as a truly world-class institution that not only excels in academic excellence but also contributes to the global scientific community.

The internationalization of a higher educational institution is unattainable without taking the first crucial step: ensuring that employees and students have a high level of proficiency in foreign languages. The indissoluble link between the demand for future engineers and knowledge of a foreign language establishes the primary objective of higher education institutions regarding the teaching of foreign languages. Improving the language skills of future specialists and university staff is crucial for developing competitive human resources capable of tackling complex information tasks, accessing professional knowledge in a foreign language, and communicating effectively with professionals from other countries. This is essential for facilitating foreign language instruction and enabling seamless interaction with international counterparts in the field. The focus on language proficiency is crucial to our main objective of developing graduates who can compete on a global scale and creating an environment conducive to cultural exchange within the institution. Equipping students and faculty with the necessary linguistic tools allows higher education institutions to bridge the gap between diverse cultures and promote a more interconnected and collaborative educational environment.

Purpose of the article - to analyze the professionally important qualities of future engineers and to consider communication training as a means of developing these qualities during their studies at a higher educational institution.

Analysis of recent research and publications. A number of scholars [1, 2] in the field of pedagogy have thoroughly studied the problem of forming the professionalism of future specialists. In particular, L.B. Shcherbatiuk [2], based on the acmeological approach, reveals the professionalism of the future mechanical engineer

"as a special system that unfolds its essence through the unity of two interrelated subsystems: professionalism of activity high professional qualification and competence, a variety of professional skills; and professionalism of personality...: engineering style of thinking and culture, professionally important and personal and business qualities, level of claims, motivational sphere, value orientations" [2].

By applying certain conditions (differentiation of training, use of information technologies, intensification of independent research work), the scientist forms such components of the future engineer's professionalism as professional competence, engineering style of thinking, professional culture, attitude to the chosen profession.

Presentation of the basic material. To cultivate an elite technical specialist who can thrive in the global labor market, basic language skills alone are no longer sufficient. Along with them, it is necessary to pay special attention to professional communication in a foreign language, namely:

- fluency in industry-specific negotiation techniques;
- critical analysis and interpretation of specialized literature;
- proficiency in written technical communication, etc.;
- extraction and processing of information from specialized literature;
- mastery of written technical communication skills, etc.

The proficiency and willingness to engage in professional activities, including in a foreign language, is what ultimately defines the foreign language communicative competence of a university graduate.

The importance of socio-humanitarian competences, the category of which includes foreign language communicative competence, is reflected in the quality criteria of engineering education formulated by international councils and organizations accrediting educational programs of engineering universities and certifying the level of training of their graduates.

The acquisition of foreign language communication competence by students and staff of the engineering university provides an opportunity to solve one of the main tasks currently facing Ukrainian science - a qualitative entry of Ukrainian scientists into the international arena, which will allow solving the following (global) problems

- participation in academic mobility programs, professional development abroad;
- participation in long-term research projects funded by international funds and programs;
- presentation of research results at the international level;
- effective professional communication, etc.

Coaching is considered to be an effective means of forming foreign language communicative competence. Coaching originated in the nineteenth century and was used in medicine as a method of psychotherapeutic work. In the 20th century, it became widely used in vocational education as a training method and in practical psychology as an effective technology for personal development. The development of coaching and the emergence of its various forms as a distinct training method can be attributed to K. Levin. He established specialized training groups with the goal of enhancing communication skills. It has been observed that when individuals act and learn in a group, significant changes in attitudes occur, leading to a more objective analysis of personality traits and behavior.

Coaching is a carefully designed and structured process aimed at changing attitudes, knowledge, or behavioral skills of an individual through the acquisition of learning experiences. This is done in order to effectively implement these changes in a specific activity or field [3, p. 124]. This will not only benefit the individuals themselves but also contribute to the overall development and advancement of Ukrainian science. It can help bridge the gap between localized research and global scientific discourse, fostering collaboration and innovation.

In pedagogical science, there are concepts of "training coaching" and "pedagogical coaching". Pedagogical coaching is a form of educational activity aimed at acquiring knowledge, developing skills and abilities and forming attitudes in order to increase competence in a particular area of student's life. In the process of forming professionally important qualities of future engineers, it is advisable to use coaching, which we will consider as "active learning activities of students, during which future engineers perform training exercises adapted to future professional activities under the guidance of a teacher-trainer on the basis of specially prepared instructional and methodological materials that meet modern requirements for professional activity" [3]. Coaching is a pedagogical teaching technology because it has a clear algorithm of use and guarantees the achievement of the planned result.

Coaching technologies should be considered in the context of activity-based learning, as they are based on the key principles of game modeling (effect, various exercises, associations, communication, achievement of expected results, etc.), and are balanced due to the use of traditional and innovative simulation methods of teaching.

The coaching is based on interactive learning methods - practical tasks or exercises (individual and group), games (role-playing and business), modeling of certain situations in which participants are forced to analyze their behavior; the presence of conflict and uncomfortable conditions; the need to make unusual and non-standard decisions and improvise; the dependence of the situation on the behavior of the training participants, cases, discussions, etc. - aimed at new behavioral models. The choice of methods depends on a number of factors (time, content, purpose, level of readiness and specifics of participants' training, etc.)

Coaching allows students to develop knowledge and skills in a short time that cannot be developed using traditional forms. Game moments in the classroom, emphasis on practical tasks allow mobilizing the capabilities and abilities of all coaching participants.

In psychological and pedagogical theory and practice, the following main types of social-psychological coaching are distinguished: communicative coaching (enhancing communicative competence - developing the ability to establish and maintain effective psychological contact during communication, increasing awareness and overcoming internal barriers that hinder effective communication, fostering the ability to predict another person's behavior, etc.); sensitivity coaching (fostering interpersonal sensitivity - including the ability for self-analysis and understanding others, anticipating a person's attitudes, feelings, and states under specific conditions, etc.); personal growth coaching (facilitating overall personal development among participants, including the formation of a balanced self-image, correction of maladaptive personal attitudes, resolution of intra-personal conflicts and tensions, etc.); coaching for self-awareness development (correcting and advancing self-perception, fostering self-analysis and reflection skills, increasing awareness and overcoming interpretative limitations imposed by stereotyped fragments of consciousness, etc.) [3].

The following areas of *socio-psychological coaching* are considered to be auxiliary:

- Formation of mental processes - creative thinking and mobility of thinking are developed.

- Improving subjective well-being and strengthening mental health - emotional and behavioral self-regulation abilities are developed and improved, and relaxation skills are mastered.

- Ensuring optimal functioning of groups and participants - team cohesion, conflict resolution in the group, relieving psycho-emotional stress, learning social and professional roles, etc.).

Taking into account the specifics of the activity of an engineering specialist and the list of professionally important qualities necessary for him/her to ensure effective professional interaction and development of a culture of professional communication, we consider it expedient to combine and use for this purpose elements of communication coaching, socio-psychological and practical professional coaching [4].

Foreign language communication coaching primarily involves: familiarization with the stages and types of communication, establishing contact, focusing on understanding the problem, mastering the technique of active listening, non-verbal communication (transferring information, conveying emotions, using gestures), finding a common solution, using arguments, making a decision, and leaving contact. The purpose of the foreign language communication coaching is to form and develop the foreign language communication skills of the future engineer (increasing self-confidence, openness, overcoming subjective limitations in communication, developing internal and external observation, empathy, communicative intuition) and communicative skills (establishing contact with the interlocutor, receiving and transmitting non-verbal information, asking questions, conducting a dialogue, small talk, perceiving and understanding the emotional state, effective behavior in different communication situations, etc.).

Improving the effectiveness of foreign language communication in a broad sense is impossible without changing the complex of personal qualities of a person, his or her social attitudes and general attitude to the social world and to oneself.

Socio-psychological coaching is considered as a form of specially organized communication, its psychological impact is based on active methods of group activity. Some authors propose to consider the single term "socio-psychological coaching" as a practice of psychological influence based on active methods of group activity and highlights the possibility of using trainings in the process of training future professionals. They emphasize that "coaching is a system of exercises aimed at

forming the abilities of the individual and acquiring certain professionally important skills".

The purpose of such coaching is to develop foreign language communication skills and interpersonal relationships, to form the ability to establish and develop various types of relationships between people. In the process of training future engineers, it can perform a dual function, namely, it is seen as a training "training ground" to practice the acquired practical skills in conditions close to the real engineering environment, and also provides an opportunity for personal development and correction, solving individual and group psychological problems.

Practical and professional coaching focuses on mastering the methods of professional activity in group work through the use of problem situations, a system of differentiated multi-level educational tasks, situational tasks, structural and logical diagrams, business and simulation games that model future professional situations, and reveal the importance of professional knowledge for professional activity. Problem situations can be created and implemented in different ways: the problem situation is created by the teacher and solved by him/her; the problem is only outlined by the teacher and solved by the efforts of the future specialists of engineering profiles with his/her help; the problem is independently formulated and solved by the cadets in small study groups. Problem situations can be local (their solution requires the application of knowledge elements within one topic or section) and extended (requiring interdisciplinary integration of knowledge elements).

The complex of coaching exercises (individual and group), games (role-playing and business), modeling of professional situations, which should be used for the formation and development of professionally important qualities of the future engineers in the framework of our study will be considered professional and communicative training, which is a system of conceptually, logically, thematically and structurally related classes that use active learning methods, the main result of which is the formation and improvement of skills and abilities of professional communication.

The key training procedures highlighted are as follows: identifying and evaluating the proposed problem situation, simulating a similar situation, and then repeating the desired behavior. This behavioral therapy method is effective when group members need to master new behaviors or strengthen insufficiently expressed ones.

Moreover, providing instructions that include interventions where the teacher offers prompts, hints, or advice to cadets when they encounter difficult problems, and reinforcement, conveyed through positive assessments from the teacher or other group members, serve as effective methods for increasing the likelihood of reproducing necessary actions.

In order to intensify students' participation in coaching, optimize group interaction, and develop personal and communication skills, it is important to adhere to the following principles: each participant should take an active part in the coaching; there should be reasoned, informative, personalized, imaginative feedback; there should be a trusting and open communication process based on humanism, goodwill, and willingness to interact; there should be confidentiality as a guarantee of preserving the content of communication in a separate group; and there should be a clear definition of the purpose of the coaching.

Coaching sessions should include separate practical sessions, a clearly defined coaching goal, objectives, a list and sequence of exercises, and a task to reflect on one's own communication actions.

Foreign language communicative coaching as a learning technology involves a certain sequence of actions:

1. Finding the basis for dividing the content into parts involves selecting the principle that will structure the training material. Formulating training objectives ensures a focused presentation of the material included in the course or session program. The objectives presented herein are rooted in the initial phase of identifying training needs, yet they are custom-tailored to closely align with the unique preferences and necessities of the intended audience. In accordance with the objectives, exercises (auxiliary, main) and their sequence, including gradual complication, are selected. A crucial principle in training technologies is the consistent progression from simple to complex in the development of knowledge and skills, which is in turn reflected in the training methods. The first stage is group work methods, such as case studies, role-playing games, etc., aimed at developing specific communication skills. The next stage is learning games based on deep reflection. They are extensive in content and time, and their goal is to develop the communicative competence of future engineers.

2. Determine the number and nature of the "stages" and their orientation in relation to the learning content space. The number of "stages" in training technologies is determined on the basis of diagnostic "stages". "This feature allows you to

tailor the formats and approaches of the entire training methodology, following the principle of "from simple to complex." It helps build confidence in verbal interaction before progressing into "mastering" professional collaboration.

3. Determine an acceptable means of transmitting training information at each "stage" of progression. In this case, a high degree of cadet activity is expected during the training process, which does not depend on the form and method of training (whether it is an active mini-lecture, discussion, game or simulator training, etc.

4. The stage of selecting feedback tools is a "didactic password" to move to the next "stage". The training includes reflection and debriefing, which are considered to be the most effective feedback tools in this technology.

5. Creating a control system based on comparing the result with the standard. This involves teacher control based on feedback from the students, but to a greater extent intensification of self-control.

Foreign language communication coaching is carried out through the use of certain training methods and tools. Using a variety of methods is crucial for preserving group engagement and enhancing performance. Additionally, it enables the introduction of real-life communication scenarios, making the learning experience more practical and impactful. The most popular methods used in training sessions are: mini-lecture, role-playing, case method (problem situations), brainstorming, discussion. When selecting a teaching method, instructors should consider more than just cadets' knowledge level on a topic. They should also evaluate which teaching tools can best support the material and consider the group size, as interactive forms are more effective with a limited number of participants. Additionally, they should take into account resources, as dividing into small groups requires more time and space than working as a whole group. Furthermore, the conditions of the training room should be considered; fixed workstation layouts can hinder movement and configuration changes.

It is advisable to implement communication training in stages, namely -Presentation (explanation of the purpose, content, giving examples of what to do and how to do it).

-Demonstration of situations (using a video or role-playing game to show how to do it);

-Practice (the ability to independently reproduce the relevant activity, performing exercises).

-Feedback (analysis of what was done well and what could have been done better);

-Small group discussion (exchange of opinions).

-Planning further actions (forecasting the benefits of the acquired practical skills).

To guarantee the utmost effectiveness of foreign language communication coaching in developing crucial qualities that future engineers need for professional success, such as responsibility, initiative, determination, independence, perseverance, energy, and attentiveness, as well as communicative tolerance, empathy, communicative and organizational skills, self-regulation, and communicative control, it is highly recommended to consider the distinctive learning styles of the specific audience. Additionally, make use of professionally-oriented, practically-relevant information to enhance the training experience. For this purpose, it is advisable to use specially selected training exercises, role-playing games, problematic professional situations and techniques that will contribute to the development of these qualities of a future engineer and require the use of integrated professional training content. The aforementioned factors have a positive impact on fostering an atmosphere of harmony and cooperation, cultivating a good mood, and enabling a sense of satisfaction derived from foreign language communication and cognition. The utilization of diverse learning tasks in training, aided by instructional technology, encourages profound transformations in students, manifesting in varying degrees. By catering to different learning

styles and integrating practical, job-relevant information, communication training can effectively cultivate the essential qualities required for success in the field of engineering. The use of tailored exercises, role-playing games, and real-life scenarios contributes to the development of these qualities, promoting a harmonious and cooperative atmosphere while fostering satisfaction in foreign language communication. Through the application of diverse learning tasks and instructional technology, students undergo meaningful transformations that extend to different levels of proficiency.

Conclusions. Thus, in order to meet the modern international requirements for a high-class professional (technical elite), every competitive specialist must know at least one foreign language to promote their ideas and present their scientific results on a global scale. In turn, universities need to work continuously to develop the professional and language skills of their students and staff, as well as to find opportunities for their active use in international cooperation.

The use of professional and foreign language communicative coaching in universities, which ensures the development of professionally important qualities and the implementation of integrative content in the professional training of future specialists of engineering profile, is aimed at forming the future engineers' volitional qualities, communicative tolerance, empathy, communicative and organizational aptitudes, self-regulation and communicative control.

Список використаних джерел

1. Супрун М. В. Формування основ професіоналізму майбутнього викладача вищої школи в процесі магістерської підготовки : автореф. дис. ... канд. пед. наук : 13.00.04 / М. В. Супрун ; Вінниц. держ. пед. ун-т ім. М. Коцюбинського. Вінниця, 2012. 20 с.
2. Щербатюк Л. Б. Формування професіоналізму майбутніх інженерів-механіків у процесі фахової підготовки: автореф. дис. ... канд. пед. наук : 13.00.04 / Л. Б. Щербатюк ; Південноукр. держ. пед. ун-т ім. К.Д. Ушинського. Одеса, 2007. 20 с.
3. Волкова Н. П. Інтерактивні технології навчання у вищій школі : навч.-метод. посіб. / Н. П. Волкова ; Університет імені Альфреда Нобеля. – Дніпро, 2018. 360 с.
4. Кравченко Е. В. К вопросу о психограмме личности инженера-педагога / Е. В. Кравченко // Наукова молодь : досягнення та перспективи : зб. наук. праць II Міжнар. наук.-практ. конф. Луганськ : Поліграфресурс, 2007. С. 32-36.

5. Branner P. Authority and Participation in Industry / P. Branner. London : Bastford, 1983. 378 p.

6. Prais S. L. How Europe could see the new British initiative for standardizing vocational qualifications / S. L. Prais // National Institute Economic Review. – 1989. № 2. P. 52–54.

7. Katz S. M. The Entry-Level Engineer: Problems in Transition from Student to Professional / S. M. Katz // Journal of Engineering Education. – 1993. – Vol. 82, issue 3. – P. 171–174.

References.

1. Suprun, MV 2012, 'Formuvannia osnov profesionalizmu maibutnoho vykladacha vyshchoi shkoly v protsesi mahisterskoi pidhotovky' [Developing the bases of professionalism of a future higher education teacher in the process of master's training], kand. ped. nauk abstract, Vinnytsy.derzh. ped. un-t im. M. Kotsiubynskoho, Vinnytsia.
2. Shcherbatiuk, LB 2007, 'Formuvannia profesionalizmu maibutnikh inzheneriv-mekhanikiv u protsesi fakhovoi pidhotovky' [Development of future mechanical engineers' professionalism in the process

of vocational training], kand. ped. nauk abstract, Pivdenoukr. derzh. ped. un-t im. K.D. Ushynskoho, Odesa.

3. Volkova, NP 2018, Interaktyvni tekhnolohii navchannia u vyshchii shkoli [Interactive learning technologies in higher education], Dnipro.

4. Кравченко, ЕВ 2007, 'К вопросу о психограмме личности инженера-педагога' [On the question of the psychogram of the engineer-teacher's personality], Naukova molod, Pp. 32-36.

5. Branner, P 1983, Authority and Participation in Industry, Bastford, London.

6. Prais, SL 1989, 'How Europe could see the new British initiative for standardizing vocational qualifications', National Institute Economic Review, no 2, Pp. 52-54.

7. Katz, SM 1993, 'The Entry-Level Engineer: Problems in Transition from Student to Professional' Journal of Engineering Education, Vol. 82, iss 3, Pp. 171-174.

The article was received 30 April 2024