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PEDAGOGICAL CONDITIONS OF COMMUNICATIVE COMPETENCE DEVELOPMENT OF FUTURE TEACHERS OF ENGINEERING DISCIPLINES

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The article attempts to concretize the concept of «communicative competence» of future teachers of engineering disciplines as dynamic integrative professionally-important personal quality, providing the productive intercultural professional interaction in solving engineering and pedagogical problems and communication situations in the process of pedagogical activity, and including the motivationally-valuable, cognitive, activity, reflexive and evaluative components ; to substantiate and develop the pedagogical conditions for formation of communicative competence.

The author of the article emphasizes that the communicative competence development of future teachers of engineering disciplines will be effective under the following pedagogical conditions: the enrichment of training content with material, updating the value of interpersonal and intercultural professional communication, which is reflected in the expansion of the content by providing the intellectual development of the students and the development of metacapabilities, metaknowledge, professional and personal qualities through the implementation of the principles of thematic interdisciplinary integration, diversity, multifunctionality and dynamism; substantive and continuous updating of the communicative educational environment as a cooperative product and as a process of communicative interaction, based on the systematic integration of human and professional contexts; activation of student activities in the communicative educational environment by student-centered pedagogical technologies using the pedagogical support of students. The article identifies the need to use the principle of thematic interdisciplinary integration as a way of pedagogical conditions realization, providing the communicative competence development, in which the ability to work well as part of a team, cooperation and social adaptation skills are developed and formed, significant for communicative competence. The author proposes a way to implement the principle of thematic interdisciplinary integration in the form of project methods, web projects, and portfolio as effective ways to create a meaningful, professional, creative/research product, which contributes to the communication skills intensification of future teachers of engineering disciplines.

Key words: future teacher of engineering disciplines, communicative competence, project-based learning (web-projects), case study method, portfolio, cooperation learning, pedagogical conditions, interdisciplinary integration.

Зеленін Г.І. «Педагогічні умови розвитку комунікативної компетентності майбутніх викладачів технічних дисциплін»

У статті зроблена спроба конкретизувати поняття «комунікативної компетентності» майбутніх викладачів технічних дисциплін, як динамічної інтеграційної професійно-важливої особистісної якості, що дозволяє здійснювати продуктивні міжкультурні професійні контакти при вирішенні інженерно-педагогічних завдань і ситуацій спілкування в рамках педагогічної діяльності та включає компоненти: мотиваційно-ціннісний, когнітивний, діяльнісний, рефлексивно-оцінний; обґрунтувати та розробити педагогічні умови формування комунікативної компетентності Автор статті наголошує, що формування комунікативної компетентності майбутніх викладачів технічних дисциплін буде результативним при реалізації наступних педагогічних умов: збагачення змісту освіти матеріалом, актуалізує ціннісне ставлення до міжособистісної, міжкультурної професійної комунікації, що включає розширення змісту матеріалом, забезпечує інтелектуальний розвиток студентів, формування метазадібностей, метазнання, професійних і особистісних якостей за допомогою реалізації принципів тематичної міждисциплінарної інтеграції, різноманіття, багатофункціональності, динамічності; змістовне наповнення і безперервне актуальне оновлення комунікативного освітнього середовища, як спільного продукту і як процесу комунікативної взаємодії на основі системної інтеграції

гуманітарних і професійних контекстів; активізація діяльності студентів в комунікативній освітньому середовищі особистісно-орієнтованими педагогічними технологіями з педагогічним супроводом студентів. У статті підкреслюється необхідність використання принципу тематичної міждисциплінарної інтеграції як одного з засобів реалізації педагогічних умов, що сприяють формуванню комунікативної компетентності, при якому закладаються і формуються значущі для комунікативної компетентності вміння працювати в команді, готовність до співпраці, здатність до соціальної адаптації. Автор пропонує спосіб реалізації принципу тематичної міждисциплінарної інтеграції у вигляді застосування методів проектів, веб-проектів, портфоліо як ефективних засобів створення змістовного, професійно-значущого, творчого/науково-дослідного продукту, робота над яким сприяє активізації комунікативних здібностей майбутніх викладачів технічних дисциплін.

Ключові слова: майбутній викладач технічних дисциплін, комунікативна компетенція, проектне навчання (веб-проекти), метод кейсів, портфоліо, навчання у співпраці, педагогічні умови, міждисциплінарна інтеграція.

Зеленин Г.И. «Педагогические условия развития коммуникативной компетентности будущих преподавателей технических дисциплин»

В статье сделана попытка конкретизировать понятие «коммуникативная компетентность» будущих преподавателей технических дисциплин, как динамического интеграционного профессионально-важного личностного качества, что позволяет осуществлять продуктивные межкультурные профессиональные контакты при решении инженерно-педагогических задач и коммуникационных ситуаций в рамках педагогической деятельности и включает следующие компоненты: мотивационно ценностный, когнитивный, деятельностный, рефлексивно-оценочный; обосновать и разработать педагогические условия формирования коммуникативной компетентности. Автор статьи отмечает, что формирование коммуникативной компетентности будущих преподавателей технических дисциплин будет результативным при реализации следующих педагогических условий: обогащение содержания образования материалом, который актуализирует ценностное отношение к межличностной, межкультурной профессиональной коммуникации, включая расширение образовательного контента, обеспечивает интеллектуальное развитие студентов, формирование метаспособностей, метазнания, профессиональных и личностных качеств посредством реализации принципов тематической междисциплинарной интеграции, разнообразия, многофункциональности, динамичности; содержательное наполнение и непрерывное актуальное обновление коммуникативной образовательной среды, как совместного продукта и как процесса коммуникативного взаимодействия, на основе системной интеграции гуманитарных и профессиональных контекстов; активизация деятельности студентов в коммуникативной образовательной среде при помощи личностно-ориентированных педагогических технологий с педагогическим сопровождением студентов. В статье подчеркивается необходимость использования принципа тематической междисциплинарной интеграции как одного из способов реализации педагогических условий, способствующих формированию коммуникативной компетентности, при котором закладываются и формируются значимые для коммуникативной компетентности умения: работать в команде, готовность к сотрудничеству, способность к социальной адаптации. Автор предлагает способ реализации принципа тематической междисциплинарной интеграции в виде применения методов проектов, веб-проектів, портфоліо как эффективных средств для создания содержательного, профессионально-значимого, творческого/научно-исследовательского продукта, работа над которым способствует активизации коммуникативных способностей будущих преподавателей технических дисциплин.

Ключевые слова: будущий преподаватель технических дисциплин, коммуникативная компетенция, проектное обучение (веб-проекты), метод кейсов, портфоліо, обучение в сотрудничестве, педагогические условия, междисциплинарная интеграция.

Formulation of the problem. Nowadays the economic progress in Ukraine requires modern system of engineer-pedagogical education to train a qualitatively different graduate, whose professional competencies are compatible with communicative preparedness to work in a professional team, including international team. A future teacher of engineering disciplines must be not only a highly

skilled professional in the engineering area, but also a person who is willing and able to provide productive communication in the professional world, in Ukrainian as well as English. The analysis of syllabuses and educational programmes for future teachers of engineering disciplines demonstrates the lack of appreciation for humanities disciplines and single-subject focus of educational process and, as a result, we

can observe insufficient level of students' communicative competency.

Analysis of actual researches. In assessing the problem elaboration regarding formation of communicative competency in educational process of a higher school, we cannot fail to mention the versatility of this phenomenon. The scientists' studies relate to general problems of communicative competency development, identification of its essence and structure (I. A. Zimnaya, A. N. Leontyeva, M. I. Lisina, I. A. Richards), combination of skills and abilities, necessary for effective communication (G. M. Andreeva, A. A. Bodalev, Y. M. Zhukov, E. L. Meliburda). Communicative competency is considered in relation to the internal value system of a person (A. Maslou, Y. L. Moreno, G. Olport); problems of linguistics (L. K. Geihman, N. Homskiy, Lyle F. Bachman). B. Amadei, G. Bugliarello, L. Corrello, D. P. Dannels, A. L. Darling, K. McCormick, M. Yusoff have studied psychological and pedagogical conditions for communicative competence and verbal and cognitive development (M. N. Vyatutnev, P. Y. Galperin, N. D. Galskova, G. A. Kitaygorodskaya, E. V. Klyuev, A. A. Leontyev, E. I. Passov, E. S. Polat and others).

The analysis of theoretical researches and training practices represent multidimensional character of communicative competency, by singling out its characteristics, which are reflected in activity. Despite the active interest of scientists to the problem of communicative competence development, there is lack of scientific knowledge and practices, unleashing the potential of educational opportunities for a higher educational establishment in communicative competence development, and more particularly of future teachers of engineering disciplines. The primary difference of engineering training possibilities from humanitarian areas is the significant disparity in the volume of communicative practices, the absence of demand for communicative competency in the training process, and, consequently, in its implementation. However, while recognizing the theoretical and practical significance of existing studies and reports, it must be noted that, under the current circumstances, there are some contradictions between:

- the demands to the level of communicative competency of future teachers of engineering disciplines, determining their readiness for vocational activity in the context of intercultural interactions and the inconsistency of practical training of graduates with these demands;

- the potential of educational programs of future teachers of engineering specialties for communicative competency development and

insufficient elaboration of pedagogical conditions for this process.

The aim of this article is to concretize the concept of «communicative competence» of future teachers of engineering disciplines; to substantiate and develop the pedagogical conditions for formation of communicative competence; to consider a way to implement the principle of thematic interdisciplinary integration in the form of project methods, web projects, and portfolio as effective ways to create a meaningful, professional, creative/research product, which contributes to the communication skills intensification of future teachers of engineering disciplines.

Presentation of the main material. Communicative competence is an integrative personality trait, reflecting individual psychological characteristics of each individual person. Yackobivits considers that « the speed of a second language acquisition and effective use of a language in the communication are factors of linguistic ability implementation, dependent on individual characteristics (development level of intelligence, previous experience, physical development, motivation, etc.) » (Uvarova, 1998, p. 63). Any its quality «is included» in communication, engaging in communicative process, and as a result, affects its efficiency. Therefore, in the process of communicative competency development of future teachers of engineering disciplines, it is necessary to create such pedagogical conditions, that will facilitate to demonstrate personal traits of subjects of educational process, i.e. external elements of pedagogical conditions, designed by educators, should work on changing internal elements of pedagogical conditions, which is reflected in the students' inclusion, their personal traits building, conducive to communicative competence development.

Despite the specific features of educational subjects in technical higher schools, demonstrated in prevalence of technical and special disciplines, dominance of laboratory works and industrial practices, it is submitted that motivationally-valuable component of communicative competency of future teachers of engineering disciplines, expressed in needs to initiate the communicative act, to understand the partner's motive, to realize the diversity of values and differences, forms of modern culture, means and methods of cultural communications, can be considered as a formed structure at sufficiently level. The main challenges arise with competent implementation of intercultural professional communication (cognitive and activity components of communicative competence). The concern that emerges in this case is how to improve existing

pedagogical conditions communicative competence development, that are relevant to technical higher school, there is a problem regarding low level of student's communicative competence formedness and limited labour intensity, forming this competency, on the one hand, and strong tendency to strengthen the requirements for a teacher of engineering disciplines, on the other hand.

The globalization processes of modern economy, the proximity and affordability of world experience because of rapidly evolving information technologies are forced to develop new educational standards, aimed at approaches, used in today's world. The *first pedagogical condition* of communicative competence development of students in a technical higher school is the content expansion and enriching the training materials that involves not only professional but also personal traits of trainees. Enriching the content is a process of updating and supplementing content of education beyond the traditional curriculum. In this particular instance, enriching content is based on a principle of thematic interdisciplinary integration, proposed by N. B. Shumakova, as well as some foreign scientists. Thematic interdisciplinary integration is a way of organizing learning content, at the core of which is an integration of subjects of study, themes, problems from different areas of knowledge through their conceptual linking with the general ideas of interdisciplinary nature, providing the meaning of the global theme (Gunn, 2006, p.116; Lang, 1999, p.83). In our view, enriching the content, based on applying the principle of thematic interdisciplinary integration, will contribute to developing of communicative competence of future teachers of engineering disciplines.

Integrative approach for preparing the specialists under current conditions is becoming a key feature in meeting challenges in improving the quality of vocational education. Discipline «A foreign language» is capable of participating in large number of interdisciplinary links, as it is a means of expression thoughts about an objective reality, and it is subjectless, because the properties and patterns of this reality are the subject of other disciplines learning (Gunn, 2006, p.108). Therefore it is necessary to link (thematically) not only humanities among themselves with the aim of promoting skills of effective communication, but also to draw a link throughout curricula of the humanities courses by means of professionally oriented training, through saturated professional relevant context (content). Traditionally, the main goal of language teacher is to provide students with language knowledge and to develop speech skills and abilities in professional and common spheres, but nowadays the content of

discipline is much deeper. The focus is shifting to language training of a specialist, which develops the ability to work in teams, the readiness to cooperate and collaborate, the ability to adapt. To enhance the success of above-mentioned content of education, which contributes to the development process of communicative competence of future teachers of engineering disciplines, it is necessary to apply certain active teaching technologies. The project-based learning (web-projects) and case study method, including portfolio, discussion of problematic issues, cooperation learning are the most effective in the teaching process.

Project-based learning involves problem-solving challenge and provides for the use of various training techniques and means, as well as necessity of knowledge and skills integration from different spheres of science, engineering and creative fields. Solving the problem also implies to elicit a particular response, which can be seen, understood, applied in actual practice, which is the basis of project-based learning. In other words, project-based learning is based on the concept of «project», its pragmatic orientation towards result, which can be obtained at solving one or other practical or theoretical problem. This result can be seen, understood and applied in practical activity .

In the USA, Great Britain, Belgium, Israel, Finland, Germany, Italy, Netherlands and many other countries, J. Dewey's ideas of humanistic approach towards education have become widespread and gained a lot of popularity. According to V.V. Guseev, interdisciplinary projects might become integrating factors, overcoming the discretion of education (Guzeev, 2000, p.206). Thematic coverage of projects has to be relevant and involve students' knowledge from various spheres, their creative thinking, investigation skills and raising awareness on a variety of issues. Through similar subject matter, the quite natural integration of knowledge has been achieved. Humanities possess diversity of the material to carry out project activity, but integrated interdisciplinary projects can unleash the communicative potential of subject of learning as well as the entire education structure. Future teachers of engineering disciplines have technical mind, special kind of intelligence. They seek to understand concepts, laws, and definitions clearly and unequivocally, prefer logic, algorithmic, brevity. Enriching the content of education with the application of integrated interdisciplinary projects would allow discovering usefulness and feasibility of these disciplines learning. Moreover, the development and realization of training project in the professional and personal context will facilitate the inclusion and the further development of

communicative competence. Since the final result of any project, as stated before, is a certain product, the students should not only collect the material, but also develop and formulate their own point of view, which involve a number of creative tasks, such as, for example, writing essays and feedback on the documents and materials, depending on the subject and character of the project, the presentation of graphic, photo, audio, video and other sources according to the relevant topic, the development of questionnaires and interview etc. As a result, participants need to collect a portfolio of materials before starting to process the certain project product. Students make presentations on their portfolio, thus reporting on their work. The teacher can assess the contribution of each student to the project and their personal progress in learning process through the portfolio. The portfolio is a self-assessment tool of the student's personal cognitive, creative work, reflexing of the student's individual activity. The presentation of the portfolio demonstrates the level of student's communication competence, which is being improved throughout the preparation of both the project and the portfolio. Oral communication is a participation in discussions, argumentation of one's own position, explanations of material to another student. Written communication is expressed through the structuring of the materials for the portfolio, the logic and conciseness of all written explanations; careful and aesthetic design of the portfolio; integrity, thematic completeness of documents, presented in the portfolio; visibility and reasonableness of portfolio presentation. Therefore, portfolio is considered as a folder of achievements as well as content of course materials.

Anyway, project-based learning has considered being a progressive and relevant pedagogical technology in the current context, which integration in the higher education process is an important stage in reforming the modern educational systems in achieving the developing, student-centered and differentiated education. The ideology of this method involves the widespread use of the knowledge gained in collaborative or individual activity, the development of independent critical and creative thinking as well as a culture of communication, the ability to perform different social roles in collaborative activities, which is known to be essential to the success in the current circumstances. Students have the real opportunity, in accordance with their individual abilities, to achieve certain results in different areas of knowledge, to comprehend the knowledge gained, resulting in they are able to develop their own well-justified point of view on many professional, scientific and cultural issues.

Web project technology, combining the benefits of project-based learning, collaborative learning technologies and the opportunities provided by information and communication technologies, is important for our research, as that is a kind of updated version of project activity, taking into account the peculiarity of modern generation. This feature is that the modern student is a representative of the digital generation, living today in two realities: the virtual and the real world. The application of information technologies is appropriate at all stages of training process during implementation of the student-centered training approach. Sometimes the use of a computer with the appropriate software is the only or the most appropriate tool for teaching. Analyzing the works of N.I. Pak, we would highlight the following characteristics: modeling of phenomena and processes, mathematical calculations, monitoring and self-monitoring of the training process, project-based learning, feedback for independent learning, etc. (Pak, 2008, p.112) Web projects and traditional forms of learning are based on the same principles, but the formation of their organization and technological basis define specific features of the web projects realization. Due to telecommunications technology, the students have access to the vast information resources of the networks and the opportunity to work together with students from other countries on a project of specific interest to them. This prospect of cooperation and collaboration creates a strong motivation for their independent learning activities in groups and individually. Cooperative work encourages students to receive information and ideas from different points of view, to look for additional information and evaluate their own results. The discussion of short-term results in the classes, the debating, «brainstorming sessions» transform into a somewhat different quality, as they contain not the material of textbooks and official manuals, as well as the opinions of the project partners from other regions of the world, the data obtained by them, their interpretation of facts and phenomena. Working with information in any language requires the development of certain intellectual skills: to analyze and classify information, to select the necessary facts, to present arguments and advocate for own point of view. The web project method effectively contributes to the development of these skills. This pedagogical technology is particularly important for students who, in the context of traditional work in the classroom, are less active due to their natural shyness and fear of speaking in public. Therefore, a web project is a long-term, problem task to develop various forms of speech activities and communication competences development, resulting in web publishing.

Nowadays the case-study method has been widely distributed in higher educational environment as it is seen as one of the most effective ways of students' teaching to solve typical problems through discussion and situation analysis. However, the development of cases in professionally significant (technical) content in humanitarian disciplines to develop students' communicative competence is given only in limited circumstances in practice.

The implementation of such training technologies might be appropriate, as the case-study method involving in the learning process contributes to:

- Humanizing interrelations between participants in the educational process.
- To establish the students' subjective position.
- To develop of analytical and assessment skills, teamwork skills and to find the most rational solution to the problem.
- To develop creative approach to decision-making.
- To initiate the communicative skills.
- To develop the flexibility and dialectical thinking.

The main concepts of the training technology are the case, the situation, the analysis of the concept, the situation, and the case-method. The case is an event that has actually occurred in a particular field and has been described by the authors with the aim to initiate the discussion in the class: As a rule, the description of the case has to contain a problem or a number of direct or indirect difficulties, contradictions, hidden tasks for solving, the description of the case must contain a problem or a number of direct or indirect difficulties, contradictions, hidden tasks for solving. Therefore, the problem, which is involved in the case, is controversial; requires defining and developing one's own criteria of choice from a variety of alternatives; to come to an appropriate decision and develop an action algorithm, based on them. All the above mentioned stages are accompanied by discussions and deliberations. In this particular instance, the materials of the case provide the learners to apply the professional knowledge; the students learn new lexical and syntactical constructions, various ways of argumentation, a number of communication styles during its development. Professional knowledge and confidence in the ability to respond positively to the problem facing the team provide an additional motive to acquire a better level of communicative competence. The testing of their communicative abilities during the discussion enables students to discover their weaknesses and

encourages the desire to work towards improving their communicative skills. The students have the opportunity to practice and learn the norms and rules of communication process through disputes, discussions and argumentation. The discussion of the cases is organized in the following ways: the traditional Harvard method of open discussion, and the method of an individual or group survey (the students make a presentation). The discussion of the cases is organized in the following ways: the traditional Harvard method of open discussion and the method of individual and group interviews (the students make a presentation). The presentation or reporting of results of the case analysis is considered as very important aspect of the case - study method. The ability to present an intellectual product in public, to demonstrate its benefits and possible directions of effective use is a valuable integral quality of a modern engineering specialist. The oral presentation is stimulating, because it is difficult to ignore; it is flexible, the speakers can respond to changes in the environment, adapt their style and material according to the audience; the presentation develops the skills of public communication and forms their own image.

The intensive use of case-study learning in the process of communicative competence development of future teachers of engineering disciplines helps to solve the following tasks:

- To apply the situational education, providing a communicative environment and conditions when developing the need to use a language (native or foreign) as a means of real communication (motivationally valuable component of communicative competence).
- To develop the reading, audition and writing skills in presenting the results of the case (cognitive component of communicative competence).
- To include students in a single context of activities, resulting in increased speech readiness, heuristic capacity, where the activity is organized and enriched through communication (an active component of communicative competence).
- To analyze and understand the diversity of means and methods of cultural communication, to be ready improving one's own communicative skills (reflexive-evaluation component of communicative competence).

The interdisciplinary character of the method provides opportunities for training, practical and research cases using to solve specific problems at different stages of the communicative competence process.

The above-mentioned pedagogical technologies focus on involving students in interaction, which requires especially established

learning environment and provide the realization of the second pedagogical condition for the communicative competence development of future teachers of engineering disciplines - the substantive content and continuous updating of the communicative educational environment, based on the systematic integration of the humanitarian and professional contexts of the education programme as well as the third pedagogical condition - the revitalization of the students in the communicative educational environment.

Conclusions and perspectives of further research. Therefore, by identifying the pedagogical conditions for the communicative competence development of future teachers of engineering disciplines, we can come to the following conclusions:

- certain personal traits provide the communicative competence development and, conversely, the personal traits such as openness and tolerance, readiness to cooperate with all other members of the training process, are

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expressed and formed in the process of communicative competence development, which must be taken into account in the creation of pedagogical conditions as an opportunity of mutual using of these processes;

- the need to make use of the principle of thematic interdisciplinary integration as a means of pedagogical conditions implementation, providing the communicative competence development, whereby the teamwork skills, the readiness to cooperate, the ability to social adaptation are developed and formed significant to students' communicative competence has been identified .

- A method for the principle of thematic interdisciplinary integration realization in the application of project-based learning, web projects and a portfolio as effective ways of creating a meaningful, professional, creative/research and developmental product has been proposed. The work on these products contributes to the communication skills of future teachers of engineering disciplines.

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