



# **THEORETICAL AND APPLIED ASPECTS OF SUSTAINABLE DEVELOPMENT**

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# **THEORETICAL AND APPLIED ASPECTS OF SUSTAINABLE DEVELOPMENT**

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Aleksander Ostenda

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## PREFACE

The monograph takes a new look at various issues of science and education of European countries to ensure their sustainable development. In the modern world, with its European integration and orientation of education and science to fundamental human values, democracy, human rights, freedom to receive education, the emphasis is placed on educational and scientific tasks related to the realization of new professional tasks, answers to modern social challenges, preparation of a competitive professional etc. The entry of the world community into a new phase of cultural and historical development, the era of global and information systems and technologies, is accompanied by crisis phenomena, which touch on various spheres of human life, including science and education. Therefore, the scientific and educational issues for ensuring the sustainable development of European countries are currently relevant, and their solution will lead to scientific and educational changes, as discussed in this monograph.

The monographic research presents the scientific works of the team of authors that reveal different directions and aspects of science and education in providing sustainable development. These are: 1) The Economic Component of Sustainable Development; 2) The Role of Education in Sustainable Development; 3) Applied Aspects of Sustainable Development.

The first section of the monograph deals with issues related to economic development, with particular attention to social responsibility for business, conceptual foundations of agrarian sector, adaptive control of the personnel of the enterprises, issues of socio and ethnical marketing.

The second section of the monograph outlines the role of education in sustainable development. The authors considered the issues of methodological basis for ecological education, key competencies of education, postgraduate pedagogical education, and different innovative technologies. All the issues presented in the section have a significant impact on the improving of science and education, in each way contributing to their development.

The third section of the monograph «Applied Aspects of Sustainable Development» overviews environmental, linguistic, psychological aspects, the contribution of foreign scientists to the development of science and education.

The team of authors hopes that the monograph contains useful research results that are relevant for scientists, students and all those who are interested in different aspects of education and science taking into consideration their importance for different spheres of public life.

Yours sincerely,

*Tetyana Nestorenko*

*Aleksand*

## 24 COMMUNICATIVE COMPETENCE IN THE SYSTEM OF EDUCATIONAL TRAINING OF FUTURE ENGINEERS-AGRARIANS

At the present stage of social development the new tasks caused by the needs of the time appeared before the professional education of Ukraine. The problem of forming a personality that can appropriate to use the knowledge and skills, able to apply them in new working conditions, capable to the self-development and self-improvement is particularly urgent. The rapid economic development of Ukraine, scientific and technological progress and accession to the Bologna declaration stipulate the necessity to improve the professional education of engineers-agrarians. Thus one of the main tasks of modern engineering education is the formation of the communicative competence of the engineer on the basis of mastering the system of knowledge about nature, man, society, mastering the means of cognitive and practical activity.

**The analysis of recent studies and publications.** The analysis of the psychological and pedagogical literature shows that the development of key competencies advanced by the society to higher engineering education, among which are the competence in professional communication as one of the directions of the improvement of the specialists' professional competence. The importance of professional communication in the activities of future specialists was studied by L. Baranovska, O. Larionova, N. Nichkalo, Y. Tatur. D. Godlevskaya, T. Hordon, Y. Zhukov, I. Zimnya, S. Kozak, L. Petrovska pay attention to the research of the specialists' communicative competence.

**The formulation the purposes of the article.** The purpose of the article is to analyze the concepts "competence", "communication", "professional competence", "communicative competence". The article examines the structure of the professional competence and proves the importance of development its components, in particular, communicative competence. The main purpose of the article is to demonstrate that the communicative competence promotes the professional development and career development of future engineers-agrarians.

**The presenting of the main material.** At present the concepts "competence" and "competency" are at the epicenter of the world thought because they open new perspectives on understanding the results of the educational activity. The idea of upbringing of a competent person and an employee which not only has the necessary knowledge, professionalism, high moral qualities, but also is able to act adequately in appropriate situations, applying this knowledge and taking responsibility for certain activities lies in the basis of their concept.<sup>196</sup> The various sources include the concepts similar to their semantics: "competence and "basic competencies".

The interpretation of the concept "competence" is found in studies of various authors. I. Chemeris considers that the difference in the translation of the English word "competency" can be one of the reasons for existence of for the concepts similar by the semantics. The word "competency" was mistakenly translated as "competence" by calculating in Ukrainian. Besides, two Ukrainian equivalents "компетентність" and "компетенція" correspond to one English *competency(e)*. **Competency (e):** a) competence; b) legal term – competence, legal capacity.<sup>197</sup>

The substance of the concept "competence" was deeply developed by the British psychologist J. Raven in his writings "Competence in Modern Society" and "Pedagogical Testing". In his opinion, "competence is the specific ability that is required to effectively performance of a specific action in a specific subject area that covers the professional knowledge, subject skills, ways of thinking and understanding of the responsibility for their actions". He understands the complex of the cognitive and emotional components of effective human life by "competence" and interprets this concept as motivated abilities.<sup>198</sup> A. Savenkov, a Russian scientist, addressing to the interpretation of the concept "competence", separates its two types: formal and real.<sup>199</sup> By the first

<sup>196</sup> Taranenko I. (2000): Development of vital competence and social integration: the experience of European countries, p. 38-40.

<sup>197</sup> Muller V. (2003): New English-Russian Dictionary, p. 326.

<sup>198</sup> Raven J. (2002): Competence in Modern Society: Identification, Development and Realization, p. 214.

<sup>199</sup> Savenkov A. (2004): Aspects of competence, p. 62.

interpretation the author understands the competence associated with the field of diplomacy, management, where the presence of the personality of certain official powers to perform certain functions is often in the first place. At the same time the real competence is knowledge and experience in a particular industry. The author continues the research of such scientists as D. Groot, J. Raven, R. Sternberg, I. Lerner, J. Anderson, J. Broadbent and separates four levels of competence:

- 1) knowledge and their organization;
- 2) skills for apply of the knowledge;
- 3) intellectual and creative potential of the personality (R. Sternberg considered it as a variant of competence – “practical intelligence”);
- 4) focus on the positive, emotional and moral potential of the personality.

During the analysis and systematization of the competences in pedagogy we often meet the concepts “basic” and “key” competences. D. Ivanov interprets the concept “key competences” as the most general (universal) abilities and skills that allow a person to understand the situation and achieve the results in personal and professional life in the conditions of the growing dynamism of modern society. The key competences are gained during the educational process and in independent social life (in professional and personal) as a result of their successful application for solving of the educational and professional tasks and problems.<sup>200</sup>

One of the ways of the improvement of the specialists’ professional competence is to develop the key competences advanced by society to higher engineering education, among which we should separate the competence in professional communication. The importance of the professional communication in the activities of future specialists was studied by L. Baranovska, O. Larionova, N. Nichkalo and Y. Tatur.

Y. Tatur, exploring professional competence, characterizes it as revealing by a specialist in practice the desire and ability (willingness, and, consequently, readiness) to realize his potential (knowledge, ability, experience, personal qualities, etc.) for the successful creative (productive) activity in the professional and social spheres, understanding the social importance and personal responsibility for the results of this activity, the necessity of its continuous improvement.<sup>201</sup>

O. Larionova divides all competencies of the specialist into five groups:

- 1) informational and methodological;
- 2) social and communicative;
- 3) operational and technological;
- 4) personal and valeological;
- 5) theoretical.

Each of the mentioned above groups of competencies includes a set of interrelated and interdependent individual competencies that manifest in the form of specific knowledge, skills and competences.

According to D. Ivanov the professional competence is a component of professional qualification and is characterized by the technical and practical skills, skills of the information processing and communication skills. According to the topic of the article we are interested in the aspect of communication, namely the communicative professional competence. The communication is a polyhedral process that is studied by philosophy, sociology, general and social psychology, linguistics, pedagogy and other sciences.

The conceptual bases for the study of the phenomenon of communication were developed in the works of V. Bekhterev, O. Leontiev and other psychologists which regarded communication as a necessary condition for the human development, its socialization and individualization. A. Derkach and N. Kuzmina indicate that communication is not only the informational exchange; it is a process of interaction and interplay. At the process of the communication as a result of systematic contacts during the joint activity its participants gain various knowledge about

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<sup>200</sup> Ivanov, D. (2007): About key competencies and competence approach in education, p. 51-61

<sup>201</sup> Tatur, Y. (2004): The competence approach in describing results and designing standards for higher professional education: materials for the second session of the methodological seminar, p.13.

themselves, their friends, ways of the most rational solution of the tasks. According to O. Leontiev although communication is a specific form of the activity it still has an active nature. At the same time the processes in which communication is a joint activity were separated. The difference between them is as follows: in the first case the fulfilling of needs is done in the activity whose organization requires the communication. In other case the communication is an independent value for the subject.<sup>202</sup>

Taking account all diversity of approaches of the scientists to the role and function of the communication we can say that all of them are based on the exclusive role of the communication both in development and functioning of the personality. The scientists pay great attention to the communication problems, pointing to its special role in solving of the educational and professional problems, to the ability of the managers to effectively collaborate with their labour collective.

So the communication can be considered as a certain type of activity which is an important component in the development of the specialist's professional qualities. The unity of the activity and communication causes the importance of analysis of the communicative competence in communication as one of the conditions for the efficiency of the professional activity of the engineer and interaction of people in the manufacturing collective.

According to the educational-qualification characteristics of the specialist of engineering profile, the students should have not only general technical and special skills, but also be able to find common ground with colleagues and perform a number of management functions. The ability to improve the psychological climate of the labour collective, to resolve labour conflicts causes to improve the labour discipline cause the necessity for the high-level communicative competence. The highly qualified specialist should be free to express the opinions, defend his or her point of view and have good knowledge. The communicative competence is one of the conditions for the intellectual and professional growth of a specialist and a mean of self-improvement and self-education.

The possession of scientific terminology plays an important role in the professional activities of the engineer for the development and presentation of the results of research activities. The ability to analyze the scientific theories, to clarify thoughts and hypotheses, to express thoughts in the form of reports, articles, textbooks – all this requires a sufficient level of speaking and writing.

“Skills” of the specialist of engineering profile assume possession by:

- the means and techniques of establishing, maintaining and terminating the speech contact; rules of oral and written speech; ability to collect, analyze and generalize the information;
- communicative culture, rules of intercultural conventions, rules of etiquette, rules of work with mass media, rules of registration of documents, ability to operate with knowledge of the current legislation of Ukraine;
- methods of research of the conflicts; ability to resolve conflicts; strategies of the conflict resolution, means of influencing the audience and impression techniques; techniques of image formation.

The specialist's “personal qualities” are universal, professional qualities and value attitudes. The ability to collect, analyze and generalize the information is one of the obligatory general qualification requirements for future engineers. They also should have perfect command of the state language. Besides, their future professional activity requires the basics of business communication in a foreign language, both verbally and in writing in typical professional situations of communication or working with the documents in a foreign language.

The professional communicative training of future engineers should include the linguistic and communicative-psychological aspects. Exploring the professional competence of the specialists of the technical profile, V. Petruk separates the basic competences that are part of its structure. The basic competencies which the modern specialist of technical profile should be developed together with the motivational and cognitive-creative should include the communicative competence based

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<sup>202</sup>Leontiev, A. (1974): Psychology of communication, p. 178.



on the ability to communicate, communication skills, ability to interact and use them in the process of work according the specialty.<sup>203</sup>

O. Ignatyuk separates the following components in the professional competence of the engineer: motivational-willed, functional, communicative and reflexive, where under the communicative component the scientist means “the ability of the clear expression of thoughts, convince, argue, analyze, express judgments, transmit rational and emotional information, coordinate the actions with colleagues, organize and maintain a dialogue.”<sup>204</sup>

Thus, after the considering the opinions of scientists we can conclude that it is possible to separate communicative competence in the structure of professional competence. It is a necessary component of the professional development of a future engineer. The communicative competence promotes the professional success and career growth of engineers, helps to meet the modern requirements of society.

D. Godlevskaya, T. Gordon, Y. Zhukov, I. Zimnya, S. Kozak and L. Petrovska pay attention to the study of the specialist’s communicative competence. The criteria for the communicative competence were firstly formulated by T. Gordon. He defined her as an ability to get out of any situation without losing an inner will and at the same time preventing it from losing it by the partner of communication. Thus, a partner position is the criterion of competence in communication or communication on “equal” (unlike to “top-down” or “bottom-up”). Y. Yemelyanov by “communicative competence” means the ability of a person to navigate the situations of communication that are based on knowledge, sensory experience and free possession of the means of communication. In his opinion, the communicative competence is acquired in society.

V. Kan-Kalik defined the communicative competence as an integral part of the human existence and activity. He emphasized that in order to communicate one should have certain skills and abilities. The target installation for the formation of the communicative competence of the personality should be determined in advance in the learning process of training. Besides, the methods and means of formation should also be determined.<sup>205</sup>

The various conceptual approaches to the communicative training of the specialists and formation of their communicative competence are represented in the scientific literature. Scientists E. Varlamov and S. Stepanov justify the reflexive-innovative approach to management training. They propose the orientation of each element of the educational programs not only to develop the professional communication skills of the manager, but also to ensure the development of his reflective and creative capabilities in the field of management as the leading didactic principle.

The formation of need of the future specialists to improve their communicative competence causes the contextual approach to the organization of learning which consists of the modelling of methods and means of subject and social content of future professional activity with the help of didactic forms. The behavioural and situational approaches are most widespread in the practice of the communicative training of future specialists. The main focus is based on the formation of skills and abilities of professional interaction, mastering the “technique” of communication, modelling and analysis of specific situations.

In order to meet professional needs and ensure a proper culture of professional communication, future specialists need to have a high level of communicative competence. Future specialist should organize training and professional development of employees, provide continuous improvement of personnel training, coordinate work on patent and inventory activities, unify, standardize and certify products, organize research and experimentation, as well as work in the field of scientific and technical information, rationalization, invention, distribution of advanced production experience. I think that possibility of realization of these functions, as well as the resolution of labour conflicts, the ability to improve the socio-psychological climate in the

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<sup>203</sup> Petruk, V. (2008): Theoretical and methodological bases of formation of basic professional competences in the future specialists of technical specialties, p. 27.

<sup>204</sup> Ignatyuk, O. (2009): Formation of future engineer readiness for professional self-improvement: theory and practice, p. 78.

<sup>205</sup> Kahn-Kalyk, V. (1987): Teacher about pedagogical communication, p. 114.

collective – all these tasks are successfully implemented if the student has a communicative competence at a high level. Communicative competence is a key in the structure of basic competences and an important component of the formation of professionally significant qualities of future specialists.

High-level communication skills of the specialists help to create a positive microclimate at the job, establish partnership relations, and achieve success in professional, organizational and managerial activities and successful adaptation in a transformational society.

The specialists' communicative competence should include knowledge of professional terminology, the ability to use it in linguistic, oral and written professional speech, based on their own internal motivation and experience, recognizing the need for self-improvement.

In the article we define the model of formation of the communicative competence of a student. It includes motivational-emotional, gnostic, conative and reflexive components and pedagogical conditions of formation of communicative competence.

The motivational-emotional component includes motives, needs and goals, which form cognitive interest to the interlocutor, readiness to start the conversation with him. This component develops the ability of a student to communicate, dispute, prove their point of view, and build a constructive conversation, while taking into account the emotional state of the interlocutor, his level of attention and the degree of physical and mental fatigue.

The gnostic component is aimed at forming of theoretical knowledge about the essence, structure, form, means, functions, types, and features of communication, understanding of the importance of communication in future professional activity, creating of analytical thinking through which communication is considered as a kind of social creativity.

Conative component involves mastering of the student by general and specific communicative skills that make it possible to establish contact with the interlocutor, control the situation of interaction with him, as well as perceptual skills that facilitate the penetration to the inner world of the communication partner.

This component of the model is aimed at developing of the ability to communicate effectively, conduct discussions, choose a strategy of behavior during a conversation, establish contacts with people, use verbal and nonverbal means of communication, predict the behavior of the partner, understand his emotional state.

The reflexive component is aimed at creating of the ability to work analytically, understand the importance and peculiarities of communicative competence for self-improvement and effective professional activity. One of the objectives of my study is to identify pedagogical conditions of the formation of communicative competence of students. In general I think that the most important pedagogical conditions are the application of a person-centered approach, modeling in the learning of communicative situations of future professional activities, the formation of professionally significant motivation of training.

So majority of approaches concerning the formation of the specialists' communicative competence are based on apply of the active methods and group forms of training aimed at mastering of the knowledge, skills and skills of professional communication by the future specialists. The organization of the communicative preparation in the conditions of educational process of the institution of higher education and use of the active methods of training is one of the ways of formation of the communicative competence of future specialists. The communicative training of specialists should be based on the integration of the disciplines of the humanitarian direction, improvement the skills of oral and written language, receptions of analytical thinking that require knowledge of languages. The communicative professional training of labor frames is one of the stages of general continuous professional training. The graduate's communicative competence anticipates: high level of practical possession of the language (state and first foreign); possession of oral and written language, means and techniques for successful business communication; possession of the second foreign language at a basic level. The graduate should have the ability to public broadcasting used in the various situations of professional activity in order to establish contacts, enter into agreements or intensify the general interest in a particular problem.

Thus, the search for the reserves of adaptation of the specialist of the technical profile to the modern level of socio-economic requirements is characterized by the idea of the communicative orientation of the system of the professional education. As a result the most appropriate communicative training for the specialists of the technical profile should provide its conceptual aspects.

The communication training has several levels. At the general level there are following sublevels: *worldview and philosophical* (formation of a humanistic communicable personality with an open consciousness for dialogue); *social* (as a means of the personality's socialization with the help of interaction with the world and himself).<sup>206</sup> At the professional level there are the following sub-levels: *psychological* (formation of the positive psychological microclimate in collectives, interaction of subjects of the production process on the basis of communication); *production* (more complete and qualitative performance of the production tasks based on the communicative and professional competence); *methodological* (active approach to training and certification training, synergetic-dialogical basis of the educational process); *didactic* (development of all spheres of personality in the process of formation and development of the communicative and professional competence, and its operation); *methodological* (adequacy and effectiveness of the choice of the forms and methods of training and certification training in the development of the communicative competence in accordance with the requirements of a position in the sectoral system of specialists' continuing professional education). Above all the training of future engineers to implement these aspects anticipates the improvement of the effective system of the communication training as dynamic, relevant and variable in its opportunities.

**Conclusions.** Summarizing the mentioned above information we can note that the communicative competence is one of the key competences of future engineers and a necessary component of their professionalism. The possession of the communicative competence at the high level helps to establish relationships in the collective and get a career growth.

#### References:

1. Ignatyuk, O. (2009): Formation of future engineer readiness for professional self-improvement: theory and practice: / monograph / Ignatyuk O. A. Kh.: NTU "KhPI", 2009.
2. Ivanov, D. (2007): About key competencies and competence approach in education / D. Ivanov // School technologies. 2007, № 5.
3. Kahn-Kalyk, V. (1987): Teacher about pedagogical communication / V. A. Kahn-Kallik. M.: Education, 1987, p. 55.
4. Leontiev, A. (1974): Psychology of communication / A. A. Leontiev. Tartu: TSU, 1974.
5. Muller V. (2003): New English-Russian Dictionary / V. K. Muller. M.: Rus. language: Media, 2003.
6. Petruk, V. (2008): Theoretical and methodological bases of formation of basic professional competences in the future specialists of technical specialties // author's abstract. diss. for the sciences. degree of doctor of ped. sciences: special. 13.00.04 "Theory and Methods of Vocational Education" / V. A. Petruk. K., 2008.
7. Raven J. (2002): Competence in Modern Society: Identification, Development and Realization / J. Raven: [trans. with English.]/. M.: Kogito-Center, 2002.
8. Savenkov A. (2004): Aspects of competence / A. I. Savenkov // School Director // Ukraine. 2004, № 6/7.
9. Taranenko I. (2000): Development of vital competence and social integration: the experience of European countries / I. Taranenko // Steps to competence and integration into society. / Edited Yermakova. K.: Context, 2000.
10. Tatur, Y. (2004): The competence approach in describing results and designing standards for higher professional education: materials for the second session of the methodological seminar / Y. Tatur. M.: EXMO-PRESS, 2004.
11. Zazulina, L. (1999): Didactic-dialogical model of teacher's certification training / L. Zazulina // Scientific-educational and social-management journal, 1999, Vol. 3. № 2.

<sup>206</sup>Zazulina, L. (1999): Didactic-dialogical model of teacher's certification training, p. 123-127.