

THE PROBLEM OF FORMATION OF PROFESSIONAL COMPETENCE OF FUTURE SPECIALISTS IN FOOD TECHNOLOGY IN THE IMPLEMENTATION OF DUAL EDUCATION

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Abstract: The article considers the essence and structure of professional competence of specialists in food technology in terms of dual education. The relevance of professional competence as an indicator of readiness to perform professional tasks, solving problems of production activities is substantiated. Among the important components of the professional competence of a food technology specialist, there are research, professional, integrative, instrumental, motivational and socio-personal competencies. These competencies reflect the readiness of future specialists in food technology to perform the tasks of professional activity. It is emphasized that modern education needs to update the educational forms and methods that determine the high level of training and motivation of future professionals, their adaptation to the conditions of production. One of the innovative forms of realization of the educational process is dual education. Among the main tasks of dual education, there are the following: formation and development of professional competence and personal qualities of future specialists in food technology to solve applied educational problems, overcoming the discrepancy between theoretical and practical training of graduates, strengthening cooperation between educational institutions and employers.

Keywords: Competence, Dual education, Food technology, Professional development.

1 Introduction

The ongoing globalization of the world economy has led to the creation of international integrated economic systems, the development of information, communication, and green technologies [1]. These profound changes in the economy also affected the education system: the traditional methods of teaching and assessing knowledge have changed, new specialties and areas of training are being formed, the mobility of students and teachers is increasing, the difference between leading universities with high human potential, research resources, and modern laboratory facilities with information and communication technologies on the one hand and other universities that do not correspond to the modern level of knowledge, on the other hand, is increasing [6].

The employability of students who have received higher education depends on the professional knowledge, skills, and competencies they have acquired that meet the requirements of the labor market [2]. As a result, the task of universities is to constantly improve educational programs based on studying the demand for higher education services and the needs of employers, integrating internships and on-the-job training into curricula, and developing partnerships with industry.

Quality assurance is an essential function of modern higher education. It is necessary to create quality management systems for higher education institutions based on the new version of the international standard ISO 9001: 2015, based on a process approach, PDCA cycle and risk-based thinking. To ensure the quality and integrity of education, faculty must be able to research and gain knowledge from a variety of sources. Greater flexibility is needed in organizing research systems so that science and interdisciplinarity can better serve the needs of all sectors of society.

2 Literature Review

Currently, a new paradigm is becoming increasingly more widespread – “lifelong learning”, which implies the comparability of qualifications, the establishment of correspondence between the levels of education and the content of formal qualifications by recognizing the validity of

knowledge, skills, and competencies through standardized assessment. This allows supporting future employees in the labor activities with extensive professional experience in various fields of activity and to provide a simplified recognition of the results of their informal, i.e., unorganized and structured, training and advanced training [20, 27, 28, 29, 30].

The food industry is one of the most dynamically developing industries. State policy is aimed at ensuring the safety and quality of food. The provisions of the Food Security Doctrine of the country have been practically implemented, which consists in providing the population with the main types of domestically produced food with a state guarantee of high quality and safety of consumed food, and increasing the economic availability of food for all groups of the population. In modern conditions of the formation and development of market relations, the food industry has turned into a powerful sector of the national economy. The use of classical and progressive food production technologies, the introduction of modern production facilities for the development of new food products, flavoring additives dictates the need for the training of modern food technology engineers capable of innovative activities and the promotion of competitive technical developments to the market.

The strategy for improving the quality of food products is focused on ensuring adequate nutrition, preventing diseases, and improving the quality of life of the population, as well as stimulating the development of production and circulation of food products of appropriate quality on the market.

At the same time, the personnel mechanisms for the implementation of the Strategy provide for:

- Increasing the prestige of professions related to agricultural production, storage and processing of raw materials, food production technologies;
- Training, retraining and advanced training of workers in the sphere of public catering, food production, health care, education and other social spheres of activity.

On the basis of this paradigm, innovative technologies are being developed that are being introduced into industry, and the results obtained are the basis for creating new training modules and disciplines, modernizing existing courses in the areas of undergraduate, graduate, and postgraduate studies.

A student who is interested in scientific progress, technology, and modern developments in the field becomes a good specialist. Much attention is paid to the issues of self-education, self-study, since it is very difficult at the lesson level to acquaint the student with all the innovations and achievements in a particular field of science and production.

It is emphasized that modern education needs to update the educational forms and methods that determine the high level of training and motivation of future professionals, their adaptation to the conditions of production [5]. One of the innovative forms of realization of the educational process is dual education. Among the main tasks of dual education, there are the following: formation and development of professional competence and personal qualities of future specialists in food technology to solve applied educational problems, overcoming the discrepancy between theoretical and practical training of graduates, strengthening cooperation between educational institutions and employers.

In the context of the Bologna Agreements, the important contribution of the sphere of higher professional education to the process of implementing lifelong learning is constantly emphasized, and the need for a competence-based approach to improve teaching methods in accordance with modern production requirements is noted [29]. To solve this problem, first of all, it is necessary to approve a new teaching model,

which implies a revision of the goals of the education received, the approval of a new paradigm for training engineers, which should correspond to the areas of application of their efforts and develop the necessary professional competencies and personal qualities of students – future specialists.

3 Materials and Methods

The methodological basis of the research was the doctrine of personality development and the role of its activities in self-development, a functional approach to scientific research, professional pedagogical culture as a component of spiritual culture, professional competence as a personal education, theories on socialization as a socio-cultural process, concrete historical, the upbringing nature of local history, on professional and pedagogical competence as a personal education.

Theoretical interdisciplinary analysis and synthesis was conducted for the achievements of philosophical, scientific and technical, food technology, psychological, pedagogical and methodological literature on the research topic [4, 10, 11, 19]; generalization of the experience of professional educational institutions [28, 30]; logical analysis of educational and software documentation. Modeling, generalization, and comparison are applied.

4 Results

A characteristic feature and indicator of the progress of modern society is the development of individual and professionally significant qualities of the individual, his abilities, thinking, cognitive needs, ensuring rights and freedoms, and more [8, 11]. Changes in the social and industrial environment, scientific and technological progress have led to an increase in the amount of theoretical knowledge, practical skills and abilities that should be developed, mastered and used by future professionals. At the same time, the professional information needed by a specialist needs constant updating and transformation.

Therefore, the competencies and the total amount of information acquired by graduates of educational institutions become obsolete after 3-5 years of intensive professional activity. At the same time, knowledge-intensive, competitive productions need constant modernization, technical updating, introduction of innovative technologies. In this regard, the higher school faces the task of training competent, highly qualified, mobile professionals who are able to constantly change the nature of work, update their knowledge and skills, who are capable of rapid adaptation, self-development and self-realization.

The successful formation of modern specialists also depends on his readiness to pursue professional activities, setting for the growth of the professional level, constant updating of their own competencies, solving production problems. Solving the problem of training of highly qualified, competitive specialists in food technology involves the orientation of the educational process on the dual form of education [18, 30]. Among the main tasks of its implementation we determine the formation and development of professional competence and personal qualities of future specialists in food technology to solve applied educational problems, overcoming the discrepancy between theoretical and practical training of graduates, improving mechanisms of interaction between businesses, the state and educational institutions, in particular, within the paradigm and practice of “triple helix”. The implementation of dual education provides training for specialists in food technology in accordance with the requirements of the labor market, the demands of employers, the specifics of food production, promotes the professional development and employment of young people [24]

The experience of European countries also shows the importance of cooperation between education, business, and the labor market players for the constant renewal of productive forces that meet the needs of society, comprehensive personal development, meeting the productive and intellectual needs of human [21]. According to modern researchers, integration processes in the educational environment is a natural trend aimed at improving

the quality of training of future professionals, strengthening the practical orientation of education, its motivational and cognitive components, employment of graduates [7, 18]. Dual education has already proven its effectiveness in terms of modern training and production activities of future professionals. Its implementation provides constant modernization and updating of educational content, increases the level of competitiveness and employment of young people, adaptation to the first job, creates appropriate conditions for training qualified personnel in accordance with the demands of specific enterprises and labor market trends, facilitates the search for young talented professionals [17, 24]. The effectiveness of knowledge, skills, and abilities acquired by students during their studies is the basis for understanding the competency approach in modern scientific thought [6]. Competence approach in the system of dual content training of future food technology specialists integrates theoretical and practical (production) components, knowledge-oriented, motivational and value components, provides for the development of professionally important personality traits, ensures a high level of self-development and self-realization [9]. Namely the competence approach provides a reorientation of the educational paradigm from the translation of knowledge to the formation of professionally necessary skills, abilities, aspirations necessary for mastering a set of competencies and acquiring professionalism [15]. Achieving professionalism involves a high level of training of specialists to perform production actions, achieve significant qualitative and quantitative results of work, solving production problems and problems related to intellectual difficulties, finding new ways of action, updating technological processes [1].

In order to obtain a clear and adequate idea of the future professional activity of food production engineers and the design of effective technologies for appropriate preparation for it, experts analyze the professional activity of food production engineers and develop a competence model of a specialist - food production engineer [22, 23]. The basis of the competence model is personal qualities (educational potential, labor and creative activity of a specialist, engineering skills, general and professional culture), competencies (social and personal, general scientific, economic and organizational and managerial, general professional, special), characteristics of the activities of an engineer (area, objects, activities). As an essential characteristic of the personality of a food production engineer, the scientists and practitioners single out the readiness for professional activity and professional orientation, which are included in the value-motivational potential of the future specialist.

As part of the innovative development of the sectors of the society's life, preference is now given to the “university – production” system. This is due to the fact that the bulk of R&D, taking into account related to intellectual property, is concentrated in universities. In the modern socio-economic conditions of the regions, the innovative development path defines new requirements for universities:

- The results of the assessment of scientific and/or scientific and technical activity and its relationship with the educational process are currently recognized as an integral part of the overall assessment of the university's activities during its state accreditation and one of the grounds for establishing (confirming) the type of higher educational institution [3];
- The main goal of the integration of science and education is to ensure the competitiveness and sustainable development of the national innovation system of any country (Ukraine in particular) on the basis of the effective functioning of scientific and educational structures as centers of advanced science, the creation of promising innovations and the training of highly qualified specialists [27].

The criteria of a modern university, university in the strategy of innovative development are as follows [28]:

- Integration of teaching and research at all stages of the educational process [16, 23];
- A high proportion of students enrolled in master's, postgraduate and doctoral programs [22];
- A large number of postgraduate training programs [25];
- Fundamental and applied research [11];
- International relations [9];
- Innovative activity and commercialization of research results [12];
- Direct participation and decisive impact on scientific, technical, and socio-economic development [2, 14].

The above mentioned paradigms and a number of various normative documents indicate that innovation is one of the components of the new generation of universities. The last criterion indicates that specialized food industry universities should play a decisive role in the innovative development of food industries.

A new direction in research and education is the creation of customer-oriented food design technology [13]. This technology puts consumers at the heart of the process of product development and manufacturing technologies, which are the tools for realizing consumer appreciation. In order to bring to the market products that will be successfully, win specific niche and market share, it is necessary to fulfill many conditions and, first of all, the condition of customer orientation. Studies have shown that the organoleptic characteristics of the product are important for the consumer: its appearance, taste, aroma, and consistency [25, 26]. Previously, there was an opinion that specialists and managers could better than the consumer put into a new product the most acceptable, in their opinion, flavor complex, to develop an optimal package design.

Recently, the situation has changed and many, primarily large food production companies, spend significant funds on research into consumer appraisal of goods. A manufacturer can gain an advantage in marketing its products if it creates a new product that attracts the attention of the buyer and meets his requirements.

In this regard, the professional self-determination of a student is considered as a rather long dynamic process of entering the profession and as a result of the choice and design of his future professional career, carried out in stages in various types of educational and practical activities [17, 30]. Active activity to stimulate the professional self-determination of students allows ensuring the formation of an individual strategy for the realization of the personality in the chosen labor activity.

In the process of practice, professional knowledge and skills are consolidated and improved; the educational opportunities of a high organization of labor are used, the responsibility for the quality of the final product is increased; economic thinking develops, etc. Therefore, one of the effective means of professional self-determination of students can be the introduction into the educational process and the organization of a new system of industrial practices based on dual education.

The most popular and showing the best results is the German dual education system. In Germany, 25% of enterprises participate in it. Thanks to the dual form of training, the student not only receives a diploma of vocational education, but also undergoes a long-term paid internship at the enterprise. After graduation, students receive guaranteed jobs [19]. The selection of students for practice in dual education takes place, as a rule, already in the first year (sometimes later) following the results of interviews or practical assignments. Selection criteria are approved in advance by the enterprise and the educational organization and announced to students.

The priority of dual education is that the graduate has all the necessary competencies for high-quality and successful work [11, 12]. When introducing dual education, the educational institution and the employer are equal partners, since the latter can participate in the development of work and individual curricula and evaluate the results of each applicant [30].

5 Discussion

Realization of the creative potential of a specialist in food technology is impossible without the formation of his professional competence [12]. The term "competence" is of general scientific nature. It is found in research in philosophy, pedagogy, economics, political science, psychology, marketing, management and more. In education, this definition is used to assess the level of training, professional development, and characterization of various aspects of their implementation. Despite the significant spread of the term "competence", in modern researchers there is no consensus on its essence, components, characteristics. In particular, "competence" is interpreted as a system of knowledge, skills, abilities necessary for the successful implementation of professional activities [1, 27]; readiness to solve professional tasks or ability to self-realization [5, 28], a category that ensures the effectiveness of activities, the ability of the individual to self-realization, self-improvement, professional development [6]. The pedagogical context of this definition reveals the skills and abilities that allow a person to adequately comply with social norms and rules [7, 22]. At the same time, "professional competence" is a set of knowledge, skills, abilities of a person that characterize the level of human education, an indicator of the acquisition of values, ideals [7]. In the context of the stated scientific research, we consider competence as a characteristic that integrates the interrelated qualities of personality, determines a person's attitude to the performance of tasks or functions of activity. At the same time, the term "professional competence" is considered by modern researchers as structuring knowledge that contributes to better performance of production tasks, a set of individual personality traits, determine the successful implementation of professional responsibilities, high productivity [6, 12], a set of knowledge, skills and abilities that contribute to the successful performance of production functions, professional responsibilities, solving problems and tasks of professional activity [8], a set of professionally significant properties and characteristics of the specialist, ensuring compliance with the needs and requirements of the profession or specialty, qualification standards, position held or performed [5]. Detailed analysis of the definition of "professional competence" allowed identifying in its content theoretical knowledge, practical skills, abilities, professionally significant qualities and personality traits necessary for the successful implementation of production functions [8, 15].

Modern understanding of a food technology specialist as a professional includes not only a set of general theoretical and special knowledge, skills and abilities, but also professionally significant personality traits, a high level of general and professional culture, self-development and self-awareness, stable motivation to perform tasks, professional responsibilities [16, 18].

In our study, we agree with those scientists who consider definition of "professional competence" as a systemic, multicomponent concept that defines the powers of a specialist in the field of activity, the level of knowledge, experience, abilities that provide the possibility of implementation in a particular activity [13]. At the same time, the result of training higher education seekers reflects the level of formation of their professional competence [12, 30], which involves the possession of basic methods and means of activity, the ability to apply them in production conditions. In the structure of professional competence, we distinguish the substantive and procedural components necessary for the successful solution of professional tasks, constant updating of knowledge, skills, abilities of a specialist in food technology [29].

Among the important components of professional competence of a specialist in food technology, we distinguish the following types of competencies: research, professional, integrative, instrumental, socio-personal, motivational [12].

Research competence characterizes the level of theoretical knowledge, practical skills, intellectual development of students,

determines the ability of the individual to analyze, summarize, classify, evaluate information on production processes and predict the possibilities of their application, to identify the scientific essence of professional problems [29]. Research competence also determines the ability of the specialist to self-development, self-improvement, provides an understanding of modern methods of knowledge of the world, the ability to self-assess their own knowledge or skills [18].

Professional competence provides the ability to effectively use knowledge, skills, abilities in a particular specialty, the ability to apply elements of experimental work, ensure high quality technological processes and food production, mastery of methods of observation, classification, analysis of food establishments [29, 30].

Integrative competence includes the ability to integrate theoretical knowledge, practical skills and abilities, the ability to comprehensively solve practical problems, training and production problems of technological, technical and organizational nature [25, 29]. We also consider the formation of personal experience of the future specialist during practical dual training to be an important characteristic of integrative competence.

Socio-personal competence is associated with the ability to think systematically and critically, the ability to fulfill social and ethical obligations, persistence in achieving goals, understanding and perception of the culture of behavior, ethical norms of communication. An important characteristic of social and personal competence is the level of formation of communication skills, the nature of communication and interpersonal interaction [18].

Instrumental competence determines the skills of information processing and management, the level of mastery of the latest information technologies, the ability to analyze information on basic professional issues [29].

Motivational competence is associated with the internal motivation of the individual, his interests, mobility, the level of formation of practical and professionally necessary abilities, the ability to make own choices, to determine the goals and objectives of professional activity [29, 30].

The formation of the above groups of competencies (integrative, motivational, instrumental professional, socio-personal) in the structure of professional competence of the future specialist in food technology is associated with the implementation of dual education [9]. At the same time, its implementation in the training of specialists in food technology on the basis of the competency approach requires the implementation of a number of measures: search for business entities interested in cooperation with educational institutions, development of regulations and methodological support of dual educational process, granting preferences to enterprises-dual partners of educational institutions.

6 Conclusion

Professional competence of future specialists in food technology is a systematic, multi-component concept that combines a wide range of theoretical knowledge, practical skills, abilities with professionally necessary abilities and personal qualities, determines the ability to successfully perform production actions, solve technological problems and tasks [10, 18, 25]. Among the important components of the professional competence of a food technology specialist, we single out research, professional, integrative, instrumental, motivational, as well as social and personal competence.

We define the readiness of graduates of educational institutions to perform the tasks of professional activity as professionalism. Improving the quality of training of future professionals, the formation of a high level of professional competence and its components are associated with the integration of knowledge, skills and abilities of students, strengthening the production

component of training, adaptation of students to the conditions of production, that is, with the introduction and implementation of dual learning. Among the components of professional competence, we attach special importance to the formation of namely professional competence, which reflects the requirements for the level of training of future professionals, determines the professionally significant qualities of their personality, characterizes the ability to use theoretical knowledge in practice.

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Primary Paper Section: A

Secondary Paper Section: AM, GM