

FORMATION OF PROFESSIONAL COMPETENCE OF FUTURE PROFESSIONALS IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

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ABSTRACT

This article is devoted to the discovery of the structure of professional competence of the future expert in the field of computer science and information technology. Here the contents of the information, motivation, software and algorithmic and creative component are widely examined. In addition, this paper describes the essence of each of these components specific to the training of specialists and information technologies, as well as the nature of their future professional activities on the base of the components of each of the components.

Keywords: Competence, systematic approach, content, information component, motivational component, software and algorithmic component, creative component competence, the system approach, the maintenance, component.

INTRODUCTION

When we carried out a research analysis of exist definitions of competence, expertise, information and communications expertise, as well as the requirements of the educational standard of education to graduate with a degree in "Computer Science and Information Technology" is defined professional competence of future professionals as an integral characteristic of the person, including the body of knowledge and skills in the field of general and special disciplines. This aggregate is formed in the study subjects educational direction, such as data structures and algorithms, computer graphics and design, programming technology, the basics of databases, system software, object-oriented programming. Moreover, it is ability how to apply them in their professional activities and motivational need for continuous professional self-education in its different directions and creative self-development.

The theoretical part

The study competence is defined as the education system, so the study of its structure, you can use a systematic approach, thus the research methodology is enriched systems analysis. The system approach is defined in modern science as a method applied to the analysis of objects, combining a plurality of interconnected elements, united by common functions and objectives, unity of management and operation. The system approach is applied to phenomena what belongs to the category of systems [4, 151].

Educational system should be regarded as an independent with the inherent any system of interconnected structural components. In this educational system is considered by us as an open self-organizing system, that is, it is riddled with deep understanding of the principles synergism. Content as a philosophical category, is a whole set of elements of various objects, phenomena and processes of reality. Content expresses itself in certain particular organization, structure [1, 14].

In turn, under the content of education is the level of personal development, social competence and subject the man he should have a result of education. Thus, the content of education is a system of knowledge, skills, traits of creative activity, philosophical personality traits, which caused by the demands of society and towards which should be directed efforts of subjects of educational activity. In addition, the content of education is shown as a pedagogically justified logically arranged, recorded in the training documentation (programs, curricula, textbooks, educational systems) and training material to be studied, determining the content of the teacher and the educational and cognitive activity of the student.

So on the basis of a systematic analysis; we identified the main structural components of professional competence: *information, motivation, software-algorithmic and creative*. Characterize the nature and character of the professional activities of each of the selected components specific to the preparation of the above considered specialists.

1. *The information component* of professional competence is determined by the knowledge and skills of students in the field of general and special disciplines aimed at independent and successful participation in the creation of objects of professional activity. In general, it is determined by the content of vocational education, which is formed in accordance with the state educational standards. Given that the student mastering specific professional competencies, information and experiences, it is clear that quality education plays a major role in the formation of this competence.

Students in learning various disciplines should be focused primarily not on the increase in the volume of knowledge, and on the way its assimilation, on the development of the image and the way of thinking, to overcome the formalism of knowledge to develop their own cognitive and creative abilities, as well as spiritually - moral sphere. Only under such conditions will develop and improve their cognitive and creative abilities, and learning activities will acquire a dynamic, procedural in nature. Assimilation of knowledge and conscious possession of this knowledge form the basis of readiness of students to further professional activity. That level of knowledge defines the information strategy for the preparation of the student. This strategy is based not only on account of the acquisition of knowledge of the student, but also on their use in applied problems of the production process in the field of information technology, characterizing its logical-thinking.

The basis of the process of training to special disciplines at the cognitive approach becomes internalized as knowledge and methods of assimilation, development of individual abilities of students. In the state educational standards fixed requirement for the formation of students' skills such as a statement of fact, planning, designing, and structuring learning activities. But during the subject teaching computer science students in the direction of "Computer Science and Information Technology," the development of these skills neglected. Therefore, cognitive operational actions, which are based on the intellectual and creative abilities of students, need to be developed throughout the training period [2, 76-94].

Information component is the theoretical basis for the formation of professional readiness of the student, as a result, to further social and professional activities. In addition, this component is determined by the needs of the individual in the active use of knowledge necessary for effective future career. General professional training, as a system component specialist training in information technology, largely depends on how diverse are used in

education means teaching special disciplines of communication and how to implement the necessary pedagogical conditions.

Outlined above is caused by the need to isolate and separate consideration of this component. Based on the study and analysis of the educational standard of education in the direction of the specifics of the training of specialists in the study subjects "Data Structures and Algorithms", "Computer graphics and design", "Programming Technology", "Database", "System Software", "Object - oriented programming" the following main components of the information component of the professional competence of these specialists:

1. Theoretical and applied knowledge in the domain of computer science necessary for successful study of general and special disciplines;
2. The ability to recognize and highlight the algorithmic processes in the course of studying of computer facilities;
3. Skills for the use of applied knowledge in search and research work;
4. Mathematical and computer knowledge and skills for their use in the development of software models of computation and information processes based on modern methods, tools and design technologies;
5. System and generalized knowledge through interdisciplinary integration of natural sciences, mathematics, general professional and special disciplines;
6. Self-deepening knowledge into future activities.

Thus, the formation of this component should occur through the integration of knowledge from many fields (mathematics, science, information, professional, etc.) through an interdisciplinary approach. The content of education covers based on interdisciplinary connections studied discipline according to the state educational standard. Based on the above can be determined that the information component is the basis for the development of professional competence of the expert in the field of "Computers and Information Technology". It and plays a main role in its backbone structure, as the quality of the acquired professional knowledge to determine the readiness of professional success.

2. *The motivational component* of professional competence of the expert in the field of "Computer Science and Information Technologies" necessitates motives for active cognitive activity in the course of preparation, creative self-development, and value-semantic relations in the process. Subject teaching special disciplines for students always motivated. Motivation is a collection of different motives, some of which may be leading, and other attendant. In addition, A.K. Markova includes motivational sphere of personality such as driving force demand, meaning, motive, purpose, emotion, attitude and interest.

Motives are a form of manifestation of needs, explain why a person acts, acts, and not otherwise. Formation of motives - is, first of all, the creation of conditions for the manifestation of internal incentives to learning, understanding of their students themselves and further self-motivational-value field. Motifs - a variety of events and conditions causing activity of the subject [7, 348].

Motivation - a combination of all factors (motivation, needs, interests, goals, etc.) that determine the motivation for learning and solving educational problems. Since motivation - a complex phenomenon, the system should provide a training set of tools to support it. Enhancing motivation to learning is one of the principles of formation of professional competence of the student in computer science and information technology.

Thus, the essence of learning motivation lies in the content of the objectives, needs and motives, in the nature of connections and relationships between them. At one goal enrolled teaching is to get in the future promising and prestigious profession, others seek to better learn about the world, others do not want to learn, but they have to do it under the pressure of parents and teachers. We see a great variety of purposes, every person they are different, so the nature of motivation each has its own characteristics. And also, the ratio appears as the desire and need of the individual to undertake the activity that brings satisfaction.

From this it follows that the subjective aspects of relations constitute the motives of activity, aspirations, interests, beliefs, etc., and the relationship between the individual motivational and value. Through motivational-value relationship of the student is the formation of the components of professional competence. Practice shows that the formation of cognitive motivation of the students in the domain of computer science and information technology occurs contradictory and difficult enough for this process, in its essence, is a multidimensional and multifaceted and requires teachers' focused, systematic work with students in many ways. First of all, this is due to the insufficient level of algorithmic and the programmer of graduates of professional colleges and academic lyceums to further education in universities. Moreover, the content of the information and communication training in the direction of "Computer Science and Information Technology" is a complex, for its assimilation requires students to many of willpower and self-study system, because the technology is changing daily and innovation. Students are faced with a saturated information material in the field of professional knowledge, which, in turn, creates some difficulties in the process of cognitive activity on special subjects. Further, the system of higher education training is significantly different from secondary education. In this regard, before the students gets an acute problem - the problem of rapid adaptation to the university education system. Students are not able to efficiently organize their activities, both in training and in non-instructional time, especially self-education. At this stage of paramount importance skillful organization of independent work of students, it is successful it becomes the key solution solving other pressing issues, such as increasing the motivation of the study of special subjects.

From the above it follows that to teachers of special subjects at the initial stage of education students gets difficult task - effective organization of independent work of students, on the successful resolution of which depends on the development of cognitive motivation of students, in general, the effectiveness of the formation of their professional competence. Motivational component includes:

1. Motivation and value attitude to cognitive, educational activities during the vocational education;
2. Value-semantic relation to the development of creative and research abilities and algorithmic programming;
3. Formation of motivation to self-education in the field of professional knowledge and self-development in this area.

Motivational component associated with the creation of conditions conducive to overcoming internal barriers, alteration of consciousness of the student, his psychological readiness to work actively with various objects and projects of special disciplines. This is achieved by forming the installation of interest, strong motivation, and increased activity of the student in the course of vocational training. In this case, the student must educate themselves in their chosen field, without much organizational effort when it is executed.

3. *Software-algorithmic components* due to the need to develop the students, the future direction of education professionals "computer science and information technology", ability to identify algorithmic processes and phenomena, the acquisition of skills for the preparation and development of optimal algorithms in the process of studying special subjects that further allow them to develop software applications and successfully implement them in various spheres of social and productive economic activity. These components are:

1. Development of the ability to identify different algorithms;
2. Skills for the compilation of various algorithms and the development of simple programs in high-level language programming.

It is specialized disciplines have significant resources to build this component by its very nature and essence, because it is riddled with various algorithms and algorithms and programming opportunities in their subject area. So, the above proves the necessity of considering the designated component of professional competence of the expert in the field of "science and information technology."

4. *Creative competence* component under consideration is determined by the need to develop creative abilities of students in order to take the initiative, independence, creativity, research capacity and development of creative abilities algorithmic programming in vocational education.

The formation of the creative person - is the primary task in the preparation of the expert in the field of "science and information technology." Her decision brings to the strategic goal - preparing competitive specialist in the modern labor market, given its rapid variability. There are various definitions of the term "creativity". In most cases, under the "creativity" is meant the ability to develop, improve and enhance technical skills, studying the problem of different points of view, finding new, unconventional solutions [6, 30]. Creativity manifested through thinking. Thinking in the philosophical sense is defined as the highest level of knowledge and the development of an ideal world in the form of theories, ideas, human purposes [3, 186].

Modern scientists N.A Muslimov, Sh.S Sharipov, N.F Vishnyakova, L.S Vygotsky, J. Guilford, E.P Torrens et al. Believe that creativity is a common feature of personality and affect the productivity of creative manifestations, regardless of the scope of personal activity. K. Ushinskiy believes that thinking, comprehension is one of the ability to develop the quality of creative activity, as well as the mechanism of its foundation. He suggests the need for education at the process of forming creative qualities in students' ideological confidence and patterns [6, 25].

Dictionary of Psychology and Education for teachers and heads of educational institutions [5, 328] defines creativity as thought in its highest form, goes beyond required to solve the problem is already known methods. Thus, analyzing the dominant role of education in the field of computer science and information technology in the training of the professionals, we can conclude that it must have creative thinking, combining algorithmic, based on research and creativity.

By far the most effective and efficient condition for the development of creative abilities of students is the research work. Modern society's demands for professional training in "computer science and information technology," put on the agenda the need to develop evidence-based methods of search and organization of research work of students. This seems perspectives and resources formation of high professional competence of future professionals.

A specialist in computer science and information technology, has the creative ability to research, will always have an advantage over their peers with no previous serious training search and research activities, and much more quickly and efficiently achieve success in professional and social activities. It has the ability to show initiative, creativity in production activities become more and more confident in their actions. Naturally, a sense of satisfaction in professional work brings success and joy in the social and personal life.

Hence the importance of student research in vocational education. Research work in modern conditions is a fundamental component in the process of training in computer science and information technology showed that, they will further be used successfully in the professional knowledge of future performance and understands the huge flow of scientific and other information. Thus, for a productive training specialist in the field of "science and information technology," he should have creative thinking as the fundamental basic skills of his training to special disciplines are research and creativity. The basis of the formation of the creative component of professional competence of the expert in the field of "science and information technologies" consists of the following:

- The development of creative abilities in the process of teaching students to special disciplines, because they occupy a dominant position in the process of training;
- Creative development of students in the process of considering the various algorithms and algorithmic programming in the domain of computer science;
- Execution of search and research work using mathematical modeling and algorithmic programming on the computer;
- Active independent work of students (study of selected topics of the course, writing essays, performing laboratory and project work, participation in scientific and methodological conferences, performance of current homework and model work with the inclusion of the tasks associated with the development of simple programs, etc.).

As a result of the work we distinguish the functional components of this competence. Functions are the contents of the formation of professional competence of students and their selection explains the procedural aspect of linguistic competence.

On the basis of this definition of professional competence we have identified the following functional components: *cognitive, developmental and search and research*. Dedicated functions, in turn, are determined by the structural components.

Analysis and evaluation of development

Dedicated components are in close co-operation to form a coherent, dynamic structural model and correspond to the major manifestations of professional competence of the expert in the field of "science and information technology." Each component has a separate component, in turn, its structural components, establishing the general framework, focused on the formation of professional competence.

CONCLUSION

Disclosed and justified the component composition of the professional competence of future professionals in computer science and information technology, including Information, motivational, software and algorithmic and creative components that allow you to identify specific features and stages of this competence, as well as create opportunities for adequate definition of formation of these components that complements the scientific understanding of

the phenomenon from the perspective of structural-functional relationships and relationships to ensure the integrity and dynamics of this system of education.

REFERENCES

1. Abduqodirov A. A., Pardaev A. X. Pedagogik texnologiyalarga oid atamalarning izohli lug'ati. – T.: “Fan va texnologiya”, 2012. – 44 b.
2. Abduqodirov A.A., Turaev B.Z. Informatika va axborot texnologiyalari sohasidagi bo'lajak mutaxassislarning kasbiy kompetentligini shakllantirish nazariyasi va metodikasi. Monografiya. – T.: “Navruz”, 2015. – 160 b.
3. Краткий философский словарь / под ред. А.П. Алексеева. – М.: Проспект, 2000. – 400 стр.
4. Полонский В.М. Словар по образованию и педагогике /В.М. Полонский. – М.: «Висшая школа», 2004. – 512 стр.
5. Психолого-педагогический словарь для учителей и руководителей общеобразовательных учреждений. – Ростов – н./Д.: Феникс, 1998. – 544 стр.
6. Шарипов Ш.С. Теория и практика обеспечения приемственности профессионального творчества учащихся: Дисс. ... док. пед. наук. – Ташкент: 2012. – 307 стр.
7. O'zbek tilining izohli lug'ati. 5 tomlik. – Tos'hkent: “O'zbekiston Milliy ensiklopediyasi”, 2006. – T. 2. – 671 b.