

COMPUTER SCIENCE IN TEACHER EDUCATION

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Abstract: Computer science and information technology in our time have acquired a basic importance not only in education but also in many areas of human activity, which forces us to pay close attention to the education of schoolchildren in this area. It is advisable in this situation to consider issues related to the training of teachers of computer science and information technology. Analyzing the experience of teacher training at the Pacific State University Pedagogical Institute, we propose to focus on the fundamentalization of training in the field of computer science. This will require teachers involved in the educational process to review the content of the courses being taught, primarily for mathematics teachers working with standard established courses. They will need to fill their courses with modern sections of their discipline, review the applications of their discipline taking into account the requirements of computer science, take into account the information technologies used in this area of science and in the process of teaching this discipline. At the same time, we should not forget that the content of school informatics significantly depends on the type and type of educational institution, that is, the development of methodological training of teachers is required. By choosing the discipline «Theoretical foundations of Computer Science», we show what, in our opinion, should be changes in the presentation of mathematical disciplines

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Introduction.

Currently, the interest in the use of computer science methods in various fields of human activity is growing more and more rapidly. Interest is shown not only by scientists, but also by various state structures both in Russia and abroad. The interest shown by various structures leads not only to the development of this direction, but also to filling it with new content, to the inclusion of new sections of fundamental sciences in the basis of computer science methods. At the same time, the instrumental and technological approach to the study and content of various sections of computer science is preserved, while both in our country and abroad, fundamental areas are often considered as secondary. At the same time, it is forgotten that the fundamental aspects of the foundation of computer science are becoming more and more relevant and necessary, providing the necessary training of specialists and scientific personnel in various fields necessary for the formation of a modern information society. The reason for this is the constant development and change of the subject area of computer science and the problem of positioning it in the system of sciences. Taking into account the changes that have taken place, in English-speaking countries, in order to intensify the development and coordination of work, it was proposed to combine under the term Computational Science the main subject areas of both fundamental and applied scientific directions, which are presented in Computer Science and Information Science and Computing Infrastructure. In Russia and European countries, this area is called computer science. Note that the content of the scientific direction of computer science and its place in the system of scientific knowledge is constantly changing, sometimes radically. Thanks to polysemy in the Russian language, we can use this term to refer to both fundamental areas and areas

related to the use of information technologies in various areas of human activity. It should be noted that historically different areas of computer science and information science are increasingly considered in various publications as a single complex scientific discipline. Let's briefly consider how the content of the subject of computer science has changed and how it has affected the content of this scientific discipline. The term "Informatics" began to be used in Russia and in France from the middle of the 20th century, but if in France informatics was considered as No. 4 2021 [SPO] 140 the science of information processing using automatic machines, then in Russia it was considered as "a field of humanitarian knowledge that studies the structure and general properties of scientific information, as well as the main laws of information communication processes" (The Great Soviet Encyclopedia [1]). Yershov [2] introduced the term "information technology" as machine data processing and associated this term with the scientific direction of computer science, setting the task of studying information technologies for computer science. With the development of computer technology and their wide spread, the instrumental and technological part of computer science has come to the fore. That is, computer science was considered as a technical science. Later, Russian scientists (A. P. Yershov. [2], Yu. I. Shemakin [3], Minina V. N. [4], Kazinets V. A. [6], Graham R. [6], Knut D. [6], Patashnik O. [6], Knut D. [7], Savelyev A. Ya. [8] et al.) clarified the term "informatics", defining it as a natural fundamental science related to the study of the properties of information and information processes in nature and society, as well as ways and means of implementing these processes. Recently, the concept of computer science as a natural fundamental science is reflected in the structure of the educational branch "Informatics", contributes to the development of social informatics, linguistic and semiotic foundations of computer science. The use

of the results and methods of computer science is growing both in scientific research and in various fields of human activity. That is, at present, the society has formed an order for computer science as a fundamental science, which leads to a shift in emphasis in the content of specific academic subjects in higher education, especially in teacher education and in the training of computer science teachers. Already in 1999, M. P. Lapchik [9] in his doctoral research. he expressed this idea as follows: "... the school needs a computer science teacher with fundamental knowledge in the field of computer science. And the amount of this knowledge is unexpected. not only has it already become quite noticeable, but it also tends to constantly (and quite vigorously) increase." We are experiencing another period of the digital revolution with an impressive pace and scale, when digital technologies are becoming the driving force for the development of the economy, political and cultural life. The terms "digitalization of education", "digital economy", "digital community", etc. are increasingly heard from the stands and even in ordinary conversations. That is, the digital environment that is being created and already existing requires teachers to have a new mentality, new forms and ways of working with students, they must be able to create and apply digital content, be able to work with information flows, use communication systems, understand the features of the structure and distribution of information, the structure of network communities and the features of social media. At the same time, digital literacy involves an understanding of digital reality, clarity when working with digital technologies and information flows. It is obvious that the digitalization of education will lead to new educational standards, the formation of new competencies, a change in the role of teachers (primarily computer science teachers) and a change in the educational process. In this situation, teachers should receive general theoretical knowledge with all the variety of external and internal

connections that reveal the content of the scientific direction "Informatics", which are stable, universal, accessible and retain their significance for a long time. It is obvious that the innovative processes associated with digitalization arise and proceed quite quickly, which brings additional complexity in the preparation of a computer science teacher. It should also be remembered that the Unified State Exam, both in mathematics and computer science, has a significant impact on the mathematical training of schoolchildren and often leads, according to V. Arnold [10], to "...emasculated and formalized teaching of mathematics at all levels". Due to the different interpretations of the term "computer science", we are faced with a serious problem of the correct reflection of the directions of development of computer science as a science and the definition of those disciplines that should be presented in the subject training. Understanding the need to fundamentalize the training of future teachers, based on the current state of computer science, we must state the lack of a comprehensive study of this issue and ways to implement this direction. In the educational environment, there is an opinion about the fundamentalization of the entire education system, which can be achieved through a radical restructuring of higher education, which is unlikely. Currently, it is possible to fundamentalize through the disciplines of subject training, while it is advisable to consider all traditional courses not just as a set, but as a single system that has a common goal function, a system with a common methodology of construction, with clearly expressed inter-subject connections. The construction of such a system should take into account the many types and types of existing educational institutions, the need to differentiate the content of training, the possibility of individualizing the learning process, the availability of elective courses, the need for the teacher to develop content and methods of working with it. Computer science,

as a subject of study, is considered in many publications, both scientific and educational, various new courses are offered to describe the fundamental foundations of computer science, new courses of mathematical foundations of computer science, some authors suggest shifting the emphasis on the means of human interaction with hardware and software, on the applied value of computer science, highlighting social, technical, biological and theoretical computer science. We will consider computer science within the framework of the existing approach reflected in higher pedagogical education in the form of two-level bachelor's and master's degree training for teachers of computer science and information technology. The training of teachers of computer science and information technology in the Russian Federation is two-stage, at the first stage we prepare bachelors, at the second (next) stage we prepare masters. It has long been established that the training of a computer science teacher in one subject is impractical (insufficient number of hours in one subject, multidisciplinary rural schools, advantages when applying for a job, etc.). Therefore, in fact, all universities train computer science teachers together with other profiles. Usually, mathematics, physics, and natural sciences are chosen as the second direction, but sometimes there are exotic combinations of computer science with primary education in a foreign language, etc. In such exotic associations, caused by some subjective circumstances, it is difficult, if not impossible, to carry out the fundamentalization of computer science. Educational standards provide a wide opportunity in the design and content of educational programs, since they define only the basic part, in which the general cultural and general professional competencies of teachers are formed.

References:

1. The Great Soviet Encyclopedia. Access mode: <https://bse.slovaronline.com/> (accessed 30.03.2021)
2. Ershov A. P. Informatika: predmet i ponyatiya [Informatics: subject and concept]. Formation of informatics. - M.: Nauka, 1986. pp. 28-31.
3. Shemakin Yu. I. Introduction to informatics / Yu. I. Shemakin. - M.: Finance and Statistics, 1985 – - 190 p.
4. Kholmurodov, S. O. (2020). Improving the structure and content of the course theory and methods of training and education in computer science in accordance with the state standards of education of Uzbekistan. *ISJ Theoretical & Applied Science*, 07 (87), 89-92.