

**Improving the professional competence in training future computer science teachers.****Mukhamadiyeva Feruza Eshnazarovna**

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**ABSTRACT**

This article discusses improving the quality of education, the task of forming and developing the competence of a computer science teacher, the goals of introducing a teaching standard aimed at improving the qualifications of teachers, and developing computational thinking.

**Keywords:** professional competence, STEM specialists, digitalization, computational thinking, inclusiveness, dialogue interaction, learning standards, computer science.

**Introduction**

It is very important for the Government of the Republic of Uzbekistan to create and successfully implement a digital economy program, since the world economy is losing competitiveness in accordance with new trends and has long-term negative consequences. The most important measure of the digital economy can be the training of qualified personnel in the field and the creation of a digital information infrastructure. Therefore, preparing a roadmap for education is of great interest and we may face some difficulties. Technical and management personnel working in digital innovation need to be trained and trained, especially at the intersection of government and business. The diffusion of digital effects varies by industry, so training needs to be aligned with the analog economy and the digital economy.

We know that one of the pressing problems today is improving the quality of education. The solution to this problem is associated with improving the content, optimizing

education technologies, and ways of organizing the educational process and, undoubtedly, rethinking the goal and result of education.

The informatization of the education system requires additional knowledge and skills of the teacher, namely, the development of the competence of information and communication technology. ICT competence is understood as a confident mastery of all components of ICT literacy skills.

**Main part**

The teaching profession is one of those professions that require constant self-development, self-improvement. The professional activity of a teacher is not predetermined for the entire period of his professional career and provides for the need for continuous education, a process of constant improvement of his professional competence.

The profession of "informatics teacher", like any pedagogical profession, differs from other professions of the "man-to-man" type and belongs to both the class of transforming and the class of managers at the same time, acquires even greater specificity - its subject is not only the link "man-man", but also a much more complex system ("man-computer-man").

The word "competence" in translation from Latin (competentia) means a range of issues in which a person is knowledgeable, has knowledge and experience. A person competent in a particular field has the appropriate knowledge, skill and ability to reasonably judge this area and act effectively in it.

The concept of "competence" does not reflect specific cognitive qualities that should be formulated in the learning process.

Competence - includes a set of interrelated personality traits, these are qualities such as knowledge, ability, skills in conducting a lesson, mastery of objects and processes that are set in relation to a certain range of objects and processes and necessary for high-quality productive activity in relation to them.

If we take into account the fact that the professional standard of the teacher defines three levels of mastery - the competence of the teacher of informatics:

- general user;
- general pedagogical;
- subject-pedagogical.

Each level of mastering competence corresponds to its own knowledge and skills that must be mastered by the teacher. To move to the next level of mastering ICT competence, the teacher must master all the components of the previous level.

The competence of a modern computer science teacher must include such concepts as:

- the ability to contribute to the creation of a unified educational information environment of an educational institution;
- the ability to carry out "dialogue interaction of teachers in networked communities", to improve qualifications using telecommunication educational technologies, etc. (network competence);
- the ability to carry out media educational activities in an audience of different age categories;
- the ability to implement information and analytical activities;
- the ability to conduct, process and analyze the results of sociological research in the education system;

- the ability to carry out heuristic, innovative marketing activities;
- the ability to develop their organizational and managerial culture;
- the ability to carry out activities in the field of management of educational informatization processes;
- the ability to implement early computer science education programs.

Computer science is an important academic subject.

To advance information technology education, we need to "provide funding, resources, tools, data and technical assistance to enable teachers to ensure that students succeed in our public schools, prepare them to gain access to vocational education and university education, and are ready to prosperity in career and life". Our vision is that "every high school graduate is ready to enter college, technical school, higher education institution, career and life."

Achieving these goals requires effective and relevant education in informatics. Although the focus on computer science education has increased in recent years, there is a widespread lack of awareness of its content and potential impact. New Computer Science Teaching Standards are designed for schools to improve teacher understanding and student learning so that students are better prepared for college, technical, college, career, and life.

School education is committed to the introduction of high-quality instructional instruction in computer science in order to:

- Increase opportunities for all students to acquire knowledge in computer science.
- To familiarize all students with fundamental concepts and applications of computer science, starting at the elementary school level.

- Make computer science available at the high school level, worthy of compulsory computer science standards.
- Offer complementary instruction in computer science for the intermediate level that allows interested students to take an in-depth study of aspects of computer science and prepare them for college, technical school, university, or careers.

Goals, standards and learning outcomes in the republic.

Learning Standards are for all of us: students, principals, administrators, decision makers, community partners, teachers, and families. They help determine what is important for students to know and be able to do in the learning process at school. Standards help ensure that students acquire the skills and knowledge they need to achieve personal and academic success. The standards also provide an opportunity to ensure consistency in what is taught to students across the country - from district to region, from school to school, and from class to class.

Four learning objectives should underlie all academic learning standards in the Republic of Uzbekistan:

1. Read with understanding, write effectively, and communicate successfully in a variety of ways and in a variety of settings and with different audiences.
2. Know and apply the basic concepts and principles of computer science, mathematics; social, physical and biological sciences; civil law and history, including different cultures and participation in representative government; geography; art; and health and physical education.
3. Think analytically, logically and creatively, integrate technological literacy and build competence, as well as diverse experiences and knowledge to form informed judgments and problem-solving.
4. Understand the importance of work and finance, as well as how productivity, effort and decisions

directly affect future career and educational opportunities.

Learning standards are mandatory elements of learning and are broadly formulated to allow local decision making. Learning activities may vary depending on school resources and community norms. The Computer Science Teaching Standards reflect a continued commitment and support to rigorous, inclusive, age-appropriate and accurate learning to ensure that students are prepared for productive and successful lives in a global society.

Informatics standards serve as a guide for teaching, reinforcing and applying learning objectives in educational institutions. They are vertically aligned to enhance learning application and depth of knowledge. When effectively implemented, these standards and outcomes will help students understand and apply the knowledge and skills necessary to thrive in the global economy and to successfully study other academic disciplines.

Learning standards are equity, access, inclusion and diversity.

Computer science, among other disciplines STEM (The abbreviation STEM stands for: S - science (natural sciences), T - technology (technology), E-engineering (engineering), M-mathematics (mathematics)), can provide knowledge and skills that enable people create technologies with broad influence. In the near future, professionals who have received education in the field of high technologies, the so-called STEM specialists, will be more and more in demand. Many highly developed countries devote an enormous amount of time and resources to this area of science. According to research data, only 1% of attracted specialists in this area increase the country's GDP by more than \$ 50 billion. And the demand for STEM specialists already now exceeds the supply twice.

People with disabilities often do not attend computer science lessons, they cannot always work in their chosen specialty and profession. Limited access to technology due to geography or poverty can also limit access and opportunities. The lack of diversity limits the scope of the problems solved and the ability of new tools and technologies to reach multiple audiences.

One way to close this opportunity gap is to increase access, involvement and opportunities for all students to learn computer science.

All students need to understand a world increasingly influenced by technology and apply computation as a tool for learning and expression across disciplines and interests. Computer science and computational thinking, core 21st century skills that increase student readiness for careers and college, university in any field, can be integrated into any discipline. Mandatory for all graduates, the School Computer Science curriculum helps define the individual student's career, college, and life goals. Computer science offers learners a solid foundation to achieve their goals.

Computer science courses and modules provide an excellent opportunity to educate students about diversity, equality, and inclusion. As noted above, the standards and supporting framework provide explicit content for inclusive and diverse computing cultures. Students can thoughtfully discuss the value of diversity by using computational thinking to develop computer artifacts to solve real-world problems. Educators and students can challenge hidden biases, computer science stereotypes and narrow-minded views by exploring core concepts such as networks and security, data analysis, and the impact of computing, because cross-cutting themes of equity and inclusion are built into the framework.

Within the framework of the project "Empowering Independent Teachers Associations in Uzbekistan", the Center for Innovation,

Technology and Strategy will provide practical assistance in the formation of a public association.

Read more:  
<https://uz.sputniknews.ru/society/20200617/14356699/V-Uzbekistane-sozdana-Assotsiatsiya-uchiteley.html>

The standards are intended to establish a baseline computer literacy level for all students and provide guidance for curriculum design, assessments and teacher training programs. It should consist of five core concepts and seven core practices, listed below:

1. Basic concepts

1) Computing systems

2) Networks and the Internet

3) Data and analysis

4) Algorithms and programming.

2. Impact of computation

1) Promoting an inclusive and diverse computing culture

2) Cooperation

3) Recognition and definition of computational problems.

4) Development and use of abstractions

5) Creation of computational artifacts

6) Testing and refinement

7) Communication

3. Basics of practice

1) Promoting an inclusive and diverse computing culture

2) Cooperation

3) Recognition and definition of computational problems.

4) Development and use of abstractions

5) Creation of computational artifacts

6) Testing and refinement

7) Communication

The Computer Science Teaching Standards and Associated Framework is a vision in which all students are introduced to the concepts and practices of computer science from an early age

to understand a world increasingly influenced by technology and to apply computation as a tool for learning and expression across disciplines and interests. ... From kindergarten to grade 12, students will develop new approaches to problem solving that harness the power of computational thinking, while becoming not only users but also creators of computing.

Computer science also has strong links with other disciplines and is gaining in importance in the workplace. Many problems in science Engineering, healthcare, business and other fields can be effectively solved with computers, but finding a solution requires both computer science experience and knowledge of a specific application. Thus, computer technology needs to be understood and often dealt with in other subjects.

#### Purpose of standards

Informatics teaching standards should be based on informatics teachers.

Computer science standards define the set of standards that are supported by the educational system. The framework suggests the steps that will be required to implement them widely. Standards introduce

The principles and methodologies of computer science adopt the computer science teaching standards developed by science for all learners, whether or not they are an established computer science education. The standards outlined in this article apply to the entire education system. They complement existing computer science and information technology curricula where they should be established, especially computer science curricula for academic lyceums. In addition, the standards complement existing curricula in other disciplines.

The concepts in the standards are contained in the basic concepts. Core Concepts are categories that represent the core areas of content in computer science.

Practice is a model of behavior and thinking that educators use in the process of learning and implementing various concepts described in the structure of education. For example, teachers will create computational artifacts, artifacts in programming (auxiliary elements of the product created during the execution of software that are part of it) to demonstrate and expand students' knowledge of algorithms. Unlike the concepts of structure, the progression in practices is not delineated by rating scales.

The concepts and practice of informatics teachers will allow:

- Be informed citizens who can critically participate in public discussion of topics related to informatics.
- Developing as learners, users and creators of computer knowledge and artifacts.
- Better understand the role of computers in the world around them.
- Continuously learn, develop, perform and express themselves in other subjects and interests.
- Increase competence, engage in self-education.

Computational thinking, the ability of a person to formulate problems in such a way that their solutions can be represented in the form of computational steps or algorithms executed by an information processing agent (such as a computer), is central to the practice and concepts of standards.

The instructional level strips associated with each instructional standard should be designed to give teachers the confidence to provide age appropriate and accurate information and instructions that get more complex from grade to grade. Competence for one level of study serves as the basis for achieving the competence of groups for the next level. Teachers can use grade ranges as starting points for teaching and as checkpoints to ensure that teaching standards are taught and applied to student abilities.

Teachers can use education teaching ranges to:

- Develop lesson plans.
- Set specific and intentional learning objectives to guide teaching and learning
- Conduct ongoing formative and summative assessments to test student understanding and learning effectiveness.
- Incorporate computational thinking into your curriculum.
- Create an equitable environment

The entire curriculum in education is defined within each subject. The course defines how to incorporate computer science teaching standards into each classroom and integrate them into relevant high school courses leading up to graduation.

Understanding the fundamentals of computer science and its underlying methodology for solving computational thinking problems is a valuable skill in our global economy. Not everyone should become a computer scientist, but all students, students should be able to explore and create through computation. Learning standards are the foundation of what learners need to know and be able to do.

There are several types of approval and different types of approval. For example, academic support and support for vocational and technical education differ - a teacher who can only teach courses in a training center, and these courses often do not meet basic educational requirements. There is no academic support for computer science, only endorsement from the teaching standard framework that teachers can obtain by demonstrating to a teacher training program that they have experience in this area and have met the program requirements.

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