



THEORETICAL ANALYSIS OF THE CONTINUITY MODEL OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY IN THE SYSTEM OF PROFESSIONAL EDUCATION

Zayniddin Yavkachevich Xudayberdiyev,

Doctor of Economics, Professor of the Institute of Pedagogical Innovations, Management of Vocational Education and Retraining and Professional Development of Teachers

Muzaffarjon Mansurjonovich Juraev,

Lecturer of the Department of Mathematics and Informatics, Faculty of Physics and Mathematics, Kokand State Pedagogical Institute named after Mukimi

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Received:	23rd August 2021	This article discusses the theoretical analysis of forming a high level of information and communication competence in the teaching of computer science and information technology to students through a continuity model in the system of professional education.
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In the Strategy of Actions for the Further Development of the Republic of Uzbekistan, it is stated that "Further improvement of the system of continuing education, increasing the capacity of quality educational services, continuing the policy of training highly qualified personnel in accordance with the modern needs of the labor market"¹. Therefore, the process of training of vocational teachers in higher education institutions is based on a comparative comparison of pedagogical problems, critical analysis, generalization and selection of optimal options for teaching methods, use of information and communication technologies, information and communication technologies, pedagogical tasks.

The term "model" in the broadest sense is any description of an object, process or event ("original"), its analogue used as a "substitute", "representative" (mental or conditional: image, description, diagram, picture, graph, plan, map and others). [1, p. 419]. It reveals the structure and content of the most important qualities and elements of real processes as an ideal reflection in general, the important interrelationships and demonstrates its development. Creating a model allows for a deeper understanding of the relationships that occur within the subject matter.

In pedagogy, the four features of the model are traditionally distinguished:

- the model is a system that is presented mentally or materially;
- the model reflects the object of research;
- the model is able to replace the object;
- model gives new information about the object [2, p. 229].

It should be noted that the model is a single, holistic education, a unique form, and at the same time a tool of scientific knowledge, the construction of which is not only a unit of analysis and synthesis, but also a creative process that includes an important part of scientific imagination.

The model, as a research tool, reflects its unique features, connections and relationships in a simple and visual way, easy and convenient to analyze. One of the most common and effective methods of testing, the effectiveness of continuity in the educational process is a model experiment, which is widely used in scientific works.

There are several steps in the process of creating a model:

- ❖ Determining the type of model;
- ❖ Identify the principles and technology of model creation;
- ❖ Consider the conditions for the implementation of the specific features of this model.

The creation of a continuity model in the teaching of computer science and information technology in the system of professional education allowed to delve deeper into the essence of the phenomenon under study, to reveal its specific connections and patterns. It should be borne in mind that at each stage of teaching computer science and information technology there is a continuity between the goals, objectives, content and forms, methods and tools used, which we consider in the "vertical" and "horizontal" planes. "Vertical" reflects the relationship between continuity, goals, objectives, functions, teaching methods. Horizontally, it is the integration of educational

¹ Decree of the President of the Republic of Uzbekistan No. PF-4947 of February 7, 2017 "On the Strategy of Actions for the further development of the Republic of Uzbekistan."

technologies that lead to the deepening of knowledge, the expansion of practical skills, the formation of worldviews, the development of students' thinking.

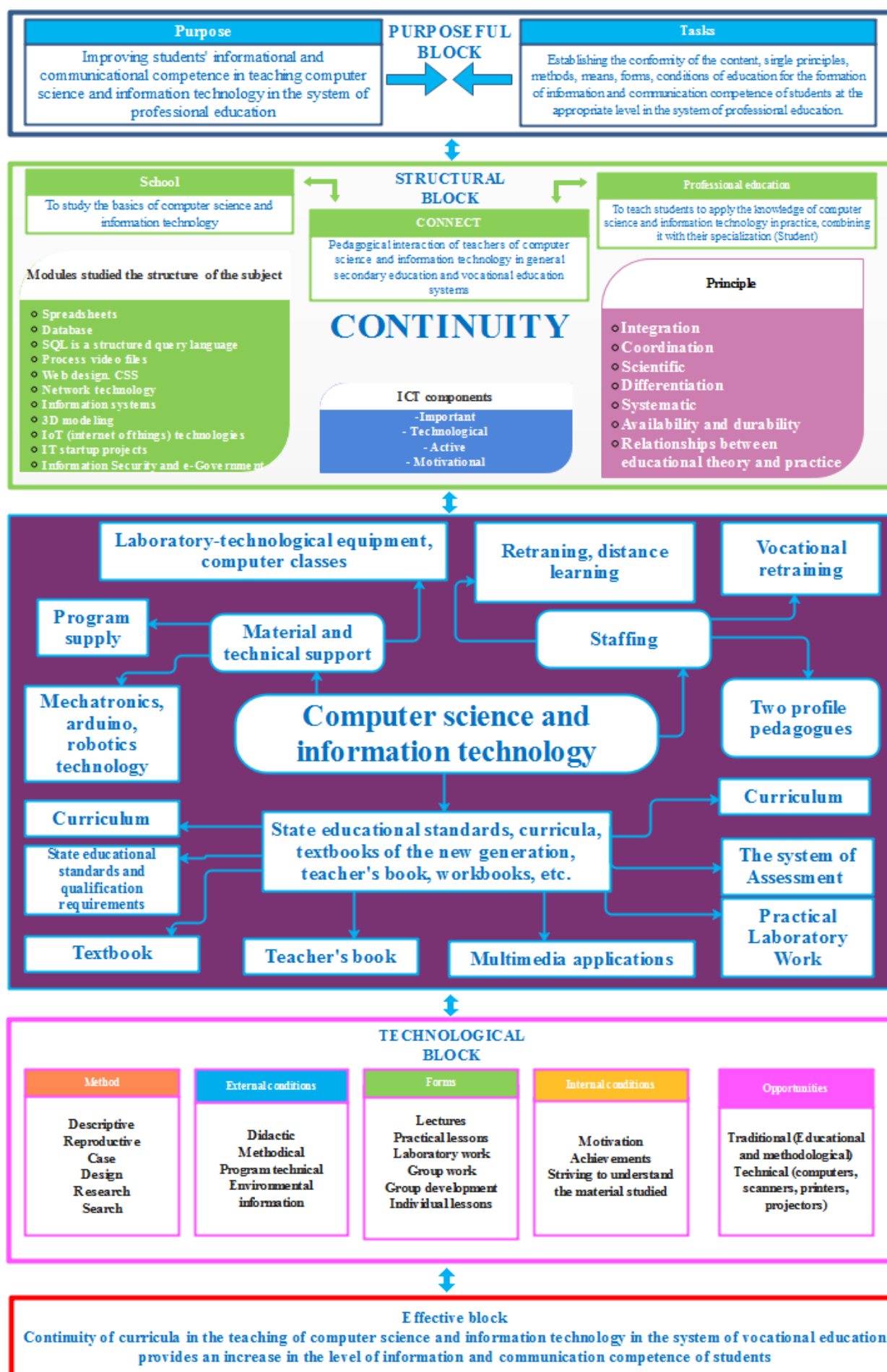
It is necessary to develop a "qualitatively new model" of training members of the information society, for them to communicate with people, actively master the scientific worldview, adapt their work functions, be a responsible citizen [3].

We have linked the development of the problem of membership at the philosophical and psychological-pedagogical level with the adequate theoretical and practical implementation of continuity in the teaching of computer science and information technology in the system of professional education. On the basis of the collected sources the mental picture of organizational and pedagogical conditions for providing a model of continuity in teaching of informatics and information technologies in system of professional education is created.

In order to create a model that is relevant today and in the future, our model must have an important feature in the system of vocational education, which includes all areas of teaching computer science and information technology. Taking into account the rapidly changing information technologies of the modern world, it is possible to predict changes in various fields of science and technology, as well as their impact on the education system. In order to quickly correct the model, it is necessary to predict the situation. Thus, we characterize the continuity model in the teaching of computer science and information technology in the system of professional education we have created.

The process we studied in the development of the model was based on the fact that the teaching of computer science and information technology in the system of vocational education should be considered as a single system, the condition of which is the continuity of all elements. This model makes it possible to exclude the episodic, segmental nature of the study of individual programs, and to predict a gradual increase in the level of information and communication competence of students. Therefore, the main methodological approach to the development of a continuity model in the teaching of computer science and information technology in the system of professional education is consistency such as the principles of self-organization, self-controlling and self-development.

A system is a set of elements (blocks) that have integral properties and laws that make up unity and integrity [4]. The dynamics of the learning process as a system can be described by determining its composition (elements or blocks), its structure (the relationship between them) in accordance with its functions. Continuity is a creative factor in the system of vocational education we have created, an integral part of the teaching of computer science and information technology. We distinguish four blocks as key elements: purposeful, systematic, technological and efficient. Each block should also be based on continuity in the study of interdependence between them, which means:



The target block includes the objectives of teaching computer science and information technology, which are expected, planned and considered as the desired outcome, which we need to achieve at each stage of training in computer science and information technology. The target block is characterized by a unity of strategic, tactical and operational learning objectives. We have formulated the main, strategic goal of our model as to ensure the continuity of teaching computer science and information technology to effectively increase the level of information and communication competence of students.

Tasks specify the goal and contribute to its achievement, so the following general tasks have been developed to ensure the continuity of teaching computer science and information technology in the system of vocational education:

- Establishing the relevance of the content, general principles, methods, tools, forms, conditions of education;
- Formation of relevant information and communication competencies of pupils and students at each stage of education;

The teaching of computer science and information technology is characterized as a process of active purposeful interaction between teacher and student. As a result, it develops certain knowledge, skills and abilities in the field of computer science. It should be noted that the study "is a connection, the perception of which is controlled in the process, the acquisition of social experience, reproduction of this or that activity" [5, p. 133]. The general and main objectives of teaching computer science and information technology in the system of vocational education include:

- Shaping the information worldview of pupils and students is in line with the current state of the information society;
- Ensuring the constant and conscious acquisition of knowledge about information processes and their role in shaping the modern scientific picture of the world;
- Forming an idea about the role and importance of information and communication technologies, software;
- Conscious and rational use of computers, education, application of technical means in the educational process, as well as the development of skills for professional use.

Student training includes a fixed core and professional component. The basic preparation of the student is based on a certain constant, informing the future specialist and giving them the skills to organize their life in the context of global communication, including professional life, to acquire worldview, logical and algorithmic thinking skills.

On the basis of a systematic approach, we clarify the completeness of the curriculum, emphasizing the five main areas of study, which form the main part of the subject of Informatics and Information Technology in the system of vocational education:

- ✚ Spreadsheets
- ✚ Database
- ✚ SQL is a structured query language
- ✚ Process video files
- ✚ Web design. CSS
- ✚ Network technology
- ✚ Information systems
- ✚ 3D modeling
- ✚ IoT (internet of things) technologies
- ✚ IT startup projects
- ✚ Information Security and e-Government

These content lines are focused on the content, aimed at continuous improvement of the level of information and communication competence, deep understanding of the study material, the formation of the ability to use knowledge in new situations and tasks. The content should be structured taking into account the principles of continuity and concentration in the study of the material, which means that the "exit" from one curriculum should naturally coincide with the "introduction" to the next, and this requires standardization of curricula on the basis of a single curriculum. The strategic goals and objectives of the whole educational process in the system of vocational education the course of computer science is designed to provide students with general educational competencies, develops systematic, logical, algorithmic thinking, including computer science, computer science, information technology, computer science and information technology.

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