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## STRUCTURAL MODEL

OF LEARNING SUCCESS FORMATION AMONG FIRST-YEAR STUDENTS OF INFORMATICS

**MODELO ESTRUCTURAL DE FORMACIÓN DE UN APRENDIZAJE DE ÉXITO EN LOS ESTUDIANTES DE PRIMER AÑO DE INFORMÁTICA**

Oksana Gushchina<sup>1</sup>

E-mail: [g\\_o\\_m@tlttsu.ru](mailto:g_o_m@tlttsu.ru)

ORCID: <https://orcid.org/0000-0003-2381-8537>

Irina Ujmanova<sup>2</sup>

E-mail: [ujmanova@yahoo.com](mailto:ujmanova@yahoo.com)

ORCID: <https://orcid.org/0000-0002-9074-2109>

Elena Zatsarinnaya<sup>3</sup>

E-mail: [zatsarinnaya.ei@yandex.ru](mailto:zatsarinnaya.ei@yandex.ru)

ORCID: <https://orcid.org/0000-0002-9400-4285>

Rustem Shichiyakh<sup>4</sup>

E-mail: [651728@mail.ru](mailto:651728@mail.ru)

ORCID: <https://orcid.org/0000-0002-5159-4350>

Natalya Solovyeva<sup>5</sup>

E-mail: [solovyevanm@rambler.ru](mailto:solovyevanm@rambler.ru)

ORCID: <https://orcid.org/0000-0003-3651-4137>

<sup>1</sup>Togliatti State University. Russian Federation.

<sup>2</sup>Branch of Ufa State Petroleum Technological University. Russian Federation.

<sup>3</sup>Plekhanov Russian University of Economics. Russian Federation.

<sup>4</sup>Kuban State Agrarian. Russian Federation.

<sup>5</sup>North-Eastern Federal University. Russian Federation.

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### ABSTRACT

An analysis of the training of specialists at the university, as well as pedagogical practice, reveals the relevance of building the educational process in junior courses, which optimally takes into account the specifics of the professional development of the student as a specialist in the information society. One of the indicators of the optimality of the organization of such a process in the study of computer science is the success of teaching junior students. The article clarifies the scientific concept "The process of formation of the success of teaching junior students", reveals the content of the components of this process and considers the structural model of the formation of the success of teaching junior students in the process of studying computer science.

**Keywords:** The process of studying computer science, educational forms, computer training, information technology management, components of the educational process.

### RESUMEN

Un análisis de la formación de especialistas en la universidad, así como la práctica pedagógica, revela la relevancia de construir el proceso educativo en los cursos junior, que tiene en cuenta de manera óptima las características específicas del desarrollo profesional del estudiante como especialista en la sociedad de la información. Uno de los indicadores de la optimización de la organización de un proceso de este tipo en el estudio de la informática es el éxito de la enseñanza de los estudiantes junior. El artículo aclara el concepto científico "El proceso de formación del éxito de la enseñanza de los estudiantes junior", revela el contenido de los componentes de este proceso, considera el modelo estructural de la formación del éxito de la enseñanza de los estudiantes junior en el proceso de estudiar informática.

**Palabras clave:** El proceso de estudiar ciencias de la computación, formas educativas, capacitación en informática, gestión de la tecnología de la información, componentes del proceso educativo.

## INTRODUCTION

The formation of fundamental knowledge in the field of computer science, the acquisition of skills in the competent use of computer technology, the development of modern software products used in various fields of activity, contribute to the formation of a modern specialist in demand on the labor market. In this regard, the organization of the educational process is relevant, taking into account the specifics of the student's professional development as a specialist in the information society (Gubareva, et al., 2018). The implementation of this direction in the field of higher education is closely related to the success of teaching junior students.

According to scientists, the characteristic social features of students are professionalization and some narrowing of interests; contradictions between increased needs and limited economic opportunities to meet them; the emergence of new relationships with adults as equal relationships; the need for a practical solution to many of the previously theoretical questions, for example, the planning of means of subsistence, the organization of one's life; contradictions between the flourishing of the intellectual and physical forces of students and the tight time limit (Andronic, 2010).

In the definition of adaptation, we adhere to the approach of Dobryak (2004), who believe that interaction is the central category in the theory of adaptation, and define adaptation as a process of successful interaction between a person and the environment with a balance of autonomy and identification in it, in as a result of which he has models and strategies of behavior that are adequate to changing conditions in this environment. This general definition applies to the process of adaptation in the educational environment (Yakunin, 1998).

An analysis of the works characterizing the training of junior students in the process of studying computer science has revealed the factors that influence the success of education, combined in three blocks: sociological (age, social background, type of education), psychological (intelligence, orientation, personal adaptive potential, position in the group) and pedagogical (level of pedagogical skill, organization of the educational environment, material and technical base, TFE).

An important role in shaping the success of teaching junior students is played by the principle of continuity in the educational space, which includes a variety of content, forms, methods, and means of teaching young people at the junction of two levels of education, capable of fulfilling a system-forming function in adapting a student to study at a university.

Ensuring the continuity between the individual links of the continuing education system in the process of teaching junior students creates the conditions for eliminating the discrepancy between the existing opportunities in secondary education in this area and the social need for the training of highly qualified senior managers (Vasilev, et al., 2016).

In the studies of Vygotsky, & Davydov (1996), A. N. Leontiev, M. N. Skatkina, the peculiarities of the development of mental processes of students, the mismatch of chronological and psychological ages are revealed, which suggests the organization of control over the student's development process in the process training for planning his activities in the zone of proximal development.

The effectiveness of the management of the learning process is achieved, according to some researchers (N.O. Verbitskaya and others), by creating a system of examination of the information environment (expert system), which provides reliable and accurate information about the activities of all elements of the system. Monitoring includes the diagnosis, forecasting and analysis of the individual personality development of the student in the learning process, the systematic receipt of information about the progress of the student in the educational process and the realization of his potential mental and personal capabilities.

In modern civilization, the success of training is impossible without the formation of the student's information culture. The studies of Danilchuk (2005), provide an understanding of the student's information culture as an integrative quality of the personality, which is a dynamic system of humanistic ideas, value-semantic orientations, personal positions and personality traits, realized in the ways of interactions, relationships, activities in the information environment and its cognition, determining a person's holistic readiness for the creative development of a new lifestyle on an information basis and manifesting itself in the specificity of educational activity. The results of the study show that student training at a university should be aimed at creating a promising level of development of information culture (Andronic, 2009).

## METHODOLOGY

By the perspective level of development of an information culture, we understand the following: students are capable of developing a strategy for the holistic implementation of any type of their own information activity, have reached the level of free orientation and self-development, personal freedom and creativity in the information environment.

The main condition for the successful organization of the learning process, according to most researchers, is a purposeful and specially organized development of students' cognitive independence in the learning process, as in classroom classes, and after school hours. The essence of cognitive independence as a personality trait lies in the ability of a person to obtain information from various sources without outside help. The greatest success in learning is achieved when the learner focuses on the independent implementation of pre-selected intellectual operations. Therefore, the identification and development of common algorithms for learning actions help students to successfully master new concepts by introducing them or building, activating the learning process. The mental actions formed on this basis are characterized by breadth of transfer, successful application in solving practical problems and are in a state of continuous improvement.

Researchers have developed various types and methods of cognitive actions, actualized by students in the study of educational material, which can stimulate the formation of students' cognitive independence: preliminary planning by students of their response and their educational activities, determining the main thing in the educational material; a comparison of certain objects, phenomena and actions; proof of some point of view, etc.

Another condition for organizing the success of student learning is that many researchers highlight the use of developing learning tools that stimulate their activity by systematically complicating the content of educational material, increasing the complexity of educational tasks, changing the way teachers and students work when organizing their implementation of particular importance in creating this condition is the deepening of problem-based learning, based on the laws of creative knowledge, modeling a problematic situation in professional or educational activities. Researchers include creative projects and developments, business computer games, computer presentations, etc. as learning tools that develop independent thinking.

In modern studies, it is proposed to intensify the educational process through pedagogical and information technologies by changing the form of organization of the educational process. Technologies are widely developed on the basis of management efficiency and the organization of the educational process.

The study of the pedagogical aspects of the success of training necessitated the theoretical modeling of the educational process of the formation of the success of students in primary schools of economic specialties.

When modeling, the following positions were taken into account, which formed the basis of the model variant: goal, theoretical approaches to the construction of the educational process, structural components, as well as pedagogical conditions that ensure the effectiveness of this process.

Based on the research results of Ilyin (2018), and others. One can consider the formation of the success of teaching junior students as a systemic holistic educational process aimed at developing positive motivation, mastering by students of professionally oriented knowledge and skills of interaction with the information environment in subject activity. The structure of the process of forming the success of teaching junior students is determined on the basis of a systematic and personality-oriented approach.

Analysis of the factors of educational success of students in a university allows to identify pedagogical conditions for the realization of the positive potentials of each person in learning taking into account sociological, psychological and pedagogical factors affecting the process of formation of success of junior students of economic specialties and ensuring the development of personality; ensuring the continuity of university and school courses; monitoring the formation of the success of students in primary schools of economic specialties and considering the implementation of the methodological system, including:

- the formation of a promising level of information culture;
- individual route of study of discipline;
- the use of problem-searching techniques, auto-didactic methods of information search.

Formation of the goals of the article (statement of the task). The purpose of the study is to determine, theoretical justification and experimental verification of pedagogical conditions that ensure the formation of the success of teaching junior students in the process of studying computer science. The object of research is the formation of the success of teaching junior students of higher educational institutions. The subject of the study is the pedagogical conditions for the formation of the success of teaching junior students in the study of computer science.

Research hypothesis: the success of teaching junior students in the study of computer science will be formed by implementing the following set of pedagogical conditions: ensuring the continuity of the university course "Informatics" and the school course "Informatics and ICT": thematic and chronological coordination of curricula, highlighting the main "through" educational lines in the system "school-university"; the development of students as subjects of productive educational and professional

activities based on the solution of applied general professional tasks; the use of active and interactive forms and methods that contribute to the dynamics of students' attitudes to the process and learning outcomes.

## RESULTS

In shaping the success of teaching junior students, we adhere to Alekseeva: *“Person-oriented learning is a type of training in which the organization of interaction between the subjects of learning is maximally focused on their personality characteristics and the specifics of personality-subject modeling of the world”* (Andronik, 2010). According to this approach, the overall goal of studying computer science is as follows: achieving the optimal level of success in teaching junior students; development of the individual's ability to implement information technology competence in various fields of professional economic activity (Akhmetshin, et al., 2017, 2019).

The most effective achievement of the set goal is possible when the interconnected and interdependent components are included in the structural model: target, substantive, organizational and effective. The target component characterizes the purpose and objectives of the simulated process. The purpose of the process under study is to increase the level of formation of the success of teaching junior students in the study of computer science. This goal is concretized in the tasks defined taking into account the structure and content of the concept of “successful learning of junior students”: the development of positive motivation for learning, the formation of a value attitude to knowledge as a source of spiritual growth; improving knowledge of the basic concepts of computer science in conjunction with future professional activities, creating a theoretical base for the subsequent study of special disciplines of the university curriculum; development of the ability to generalize, compare information, systematize it in electronic form, experimental skills, technical skills, solve problems of subject orientation, using well-known theoretical principles, mathematical apparatus, graphic tools, reference books, computer technology.

The substantial component of the simulated process involves the implementation of two directions: the selection of the content of training taking into account the main functions of the computer science course at the university (the formation of the student's system-information approach to the world, information culture and the ability to see the interconnectedness and interdependence of individual objects and phenomena); content filling the structural components of the success of learning (motivational-value, cognitive and operational).

The motivational-value component provides for the development of motives for achieving success in business, self-development, creativity in the infosphere, the development of professionally significant knowledge, skills.

The cognitive component includes activities to provide students with a professional-oriented knowledge system, hardware and software for implementing information processes of a future specialty, and involvement in creative and research activities. The operational component involves the mastery of generalized methods and techniques of cognition, information technology, the acquisition of skills used in subsequent professional activities. The organizational component involves the application of various methods and techniques (new information technologies, interactive methods, the method of information modeling, solving typical problems), tools (didactic computer environments, global television, electronic publications), forms of organization of pedagogical interaction (lecture-visualization, organizational and methodological classes, conferences, business games, express seminars, consultations, tests, practical classes, problem lectures, problem seminars) (Andronick, 2009).

Because of that it is important to observe pedagogical conditions that contribute to the formation of the success of teaching junior students for example:

- the perception of students as subjects of their own life, subjects of educational activity, capable of further psychological, personal, social development;
- ensuring the continuity of the university course “Informatics” and the school course “Informatics and ICT”: thematic and chronological coordination of curricula, highlighting the main “end-to-end” educational lines in the school-university system (for example, Information Processes, Information Modeling “,” Information Basics of Management “);
- the implementation of educational and methodological activities that contribute to the development of positive motivation for future professional activities aimed at the formation of information and technological competence (Bochkareva et al., 2018)
- specialized courses that contribute to the growth of motivation for educational and cognitive activities, the development of an attitude towards the formation of an “image of a specialist with an information culture” and a humanistic style of communication in the information environment;
- an individual route for teaching the discipline, contributing to the comprehensive development of the content of the educational material;

- the application of problem-searching teaching methods: the development of individual creative tasks of a subject orientation, situational training and production tasks, business computer games, etc.
- the use of auto-didactic techniques for searching information using navigation schemes to study discipline in hypertext systems that perform compensatory, adaptive and developmental functions;
- conducting extracurricular activities in various forms (organizational and methodological studies, scientific society, club, conferences, business games, research laboratories) (Andronic, 2010).

## CONCLUSIONS

The result of observing the above pedagogical conditions is an increase in the level of success in learning, characterized by a sign of stability and expressed in the formation of the totality of the structural components of a given personal education, adequately motivational, cognitive, and activity criteria. The effective component of the process under study characterizes the degree of achievement of the goal, includes analysis and evaluation of the results, correlation of the results with the goals and objectives of the simulated process, making adjustments as necessary. The organization of the educational process in accordance with the structural model of the formation of the success of teaching junior students in the process of studying computer science acts as an option for teaching students, aimed at correcting and improving the intellectual and emotional capabilities of the person, prevention of objective and subjective difficulties in students.

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