ISSN-p 2306-7365
ISSN-e 2664-0686

UDC 378; IRSTI 4.35.07
https://doi.org/10.47526/2023-3/2664-0686.24

Zh. BURAYEVA[1], M. SULTANMURAT[2]
[1]PhD, Khoja Akhmet Yassawi International Kazakh-Turkish University
(Kazakhstan, Turkistan), e-mail: zhanat.burayeva@ayu.edu.kz
[2]PhD, South Kazakhstan State Pedagogical Unıversıty
(Kazakhstan, Shymkent), e-mail: moldir86.86@mail.ru

STRUCTURAL-SUBSTANTIVE MODEL OF FORMATION OF PEDAGOGICAL CREATIVITY OF FUTURE TEACHERS OF COMPUTER SCIENCE

Abstract. Socio-economic development in society reflects the high demand for a creative person who can successfully solve problems and change their behavior. Modern conditions increase the need for active, business-minded, creative professionals who are able to move forward and solve various problems on their own in non-standard situations. To be confident in the face of constant change, a future computer science teacher must activate his or her creativity and help students discover their potential and focus on solving the problem.

The social demand for education is determined by the needs of the state, society and social groups. In this regard, the social order for creative people capable of creativity, striving for innovation and scientific achievements, non-standard, original thinking makes the issue of formation of pedagogical creativity of future computer science teachers relevant.

The purpose of the structural and content model of the formation of pedagogical creativity of future teachers of computer science is to form their ability to pedagogical creativity: the student's understanding of the meaning and content of pedagogical creativity; aspiration of the student to the formation of pedagogical creativity. Creativity and innovation are an integral part of the learning process and the basis of all disciplines. They are an important aspect of how to teach in the process. In addition, creativity and innovation are crucial for teachers who are improving their professional skills. In terms of creativity, teachers play an important and key role in universities, as they provide organizational support for innovation and creativity in the teaching process. The high level of creativity of teachers contributes to the development of students - to increase their competence and demand in the labor market. However, if there is a big difference between the high level of creativity of the teacher and the low level of perception of students, the high creativity of the teacher has a negative impact. In addition, factors that may have a negative impact are: irrationalism on one or both sides; lack of constructivism, low level of communication skills of the teacher; lack of feedback in the learning process, etc. The considered world trends in the development of education are general. In addition, there are new trends in the development of different types and levels of education, depending on their goals, characteristics, the nature of implementation and the new social requirements for the level of training of relevant graduates.

Keywords: creativity, pedagogical creativity, model, method, component, development.

Бізге дұрыс сілтеме жасаңыз:
Burayeva Zh., Sultanmurat M. Structural-Substantive Model of Formation of Pedagogical Creativity of Future Teachers of Computer Science // *Ясауи университетінің хабаршысы*. – 2023. – №3 (129). – Б. 322–333. https://doi.org/10.47526/2023-3/2664-0686.24

Cite us correctly:
Burayeva Zh., Sultanmurat M. Structural-Substantive Model of Formation of Pedagogical Creativity of Future Teachers of Computer Science // *Iasaui universitetinin habarshysy*. – 2023. – №3(129). – B. 322–333. https://doi.org/10.47526/2023-3/2664-0686.24

ISSN-p 2306-7365
ISSN-e 2664-0686

Ж. Бураева[1], М. Сұлтанмұрат[2]
[1]PhD, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті (Қазақстан, Түркістан қ.), e-mail: zhanat.burayeva@ayu.edu.kz
[2]PhD, Оңтүстік Қазақстан мемлекеттік педагогикалық университеті (Қазақстан, Шымкент қ.), e-mail: moldir86.86@mail.ru

Болашақ информатика мұғалімдерінің педагогикалық шығармашылығын қалыптастырудың құрылымдық-мазмұнды моделі

Аңдатпа. Қоғамдағы әлеуметтік-экономикалық даму туындаған мәселелерді сәтті шеше алатын және өз мінез-құлқын оңтайлы өзгерте алатын креативті тұлғаға сұраныстың жоғарылығын көрсетеді. Заманауи жағдайлар стандартты емес жағдайларда әр түрлі мәселелерді өз бетінше алға жылжытуға және шешуге қабілетті белсенді, іскер, креативті ойлайтын мамандарға деген қажеттілікті күшейтеді. Тұрақты өзгерістер жағдайында сенімді болу үшін болашақ информатика мұғалімі өзінің креативтілігін белсендіруі тиіс, әрі білім алушыларға өз қабілеттерін ашуға көмектесіп, туындаған мәселені шешуге бағыттауы керек.

Білімге деген әлеуметтік сұраныс мемлекеттің, қоғамның және әлеуметтік топтардың қажеттіліктерімен анықталады. Осыған байланысты шығармашылыққа қабілетті, жаңашылдық пен ғылыми жетістіктерге ұмтылатын, стандартты емес, өзіндік ойлау қабілеті бар шығармашыл адамдарға әлеуметтік тапсырыс болашақ информатика мұғалімдерінің педагогикалық шығармашылығын қалыптастыру мәселесін өзекті етеді.

Болашақ информатика мұғалімдерінің педагогикалық шығармашылығын қалыптастырудың құрылымдық-мазмұндық моделінің мақсаты – олардың педагогикалық шығармашылыққа қабілетін қалыптастыру: студенттердің педагогикалық шығармашылықтың мәні мен мазмұнын түсінуі; оқушының педагогикалық шығармашылығын қалыптастыруға үн қосуға ұмтылысы. Шығармашылық пен инновация оқу процесінің құрамдас бөлігі және барлық пәндердің негізі болып табылады. Олар процесте оқытудың маңызды аспектісі болып табылады. Сонымен қатар, кәсіби біліктілігін арттырып жатқан мұғалімдер үшін шығармашылық пен жаңашылдықтың маңызы зор. Шығармашылық тұрғысынан алғанда, оқытушылар университеттерде маңызды және негізгі рөл атқарады, өйткені олар оқыту процесінде жаңашылдық пен шығармашылықты ұйымдастырушылық қолдау көрсетеді. Мұғалімдердің шығармашылық деңгейінің жоғары болуы студенттердің дамуына – еңбек нарығында олардың құзыреттілігі мен сұранысын арттыруға ықпал етеді. Алайда, мұғалімнің шығармашылық қабілетінің жоғары деңгейі мен оқушылардың қабылдау деңгейінің төмендігінің арасында үлкен айырмашылық болса, мұғалімнің шығармашылық қабілетінің жоғары болуы кері әсерін тигізеді. Сонымен қатар, теріс әсер етуі мүмкін факторлар: бір немесе екі жақтағы иррационализм; конструктивизмнің болмауы, мұғалімнің коммуникативті дағдыларының төмендігі; оқу процесінде кері байланыстың болмауы және т.б. Білім беруді дамытудың қарастырылып отырған әлемдік тенденциялары жалпы болып табылады. Сонымен қатар, олардың мақсаттарына, ерекшеліктеріне, іске асыру сипатына және тиісті түлектерді дайындау деңгейіне қойылатын жаңа әлеуметтік талаптарға байланысты білім берудің әртүрлі түрлері мен деңгейлерінің дамуындағы жаңа тенденциялар қарастырылады.

Кілт сөздер: шығармашылық, педагогикалық шығармашылық, модель, әдіс, компонент, дамыту.

ISSN-p 2306-7365
ISSN-e 2664-0686

Ж. Бураева[1], М. Султанмурат[2]
[1]PhD, Международный казахско-турецкий университет имени Ходжи Ахмеда Ясави (Казахстан, г. Туркестан), e-mail: zhanat.burayeva@ayu.edu.kz
[2]PhD, Южно-Казахстанский государственный педагогический университет (Казахстан, г. Шымкент), e-mail: moldir86.86@mail.ru

Структурно-содержательная модель формирования педагогического творчества будущих учителей информатики

Аннотация. Социально-экономическое развитие общества отражает высокий спрос на творческую личность, способную успешно решать проблемы и менять свое поведение. Современные условия повышают потребность в активных, деловых, творческих профессионалах, способных двигаться вперед и самостоятельно решать различные задачи в нестандартных ситуациях. Чтобы чувствовать себя уверенно перед лицом постоянных изменений, будущий учитель информатики должен активизировать свои творческие способности и помочь учащимся раскрыть свой потенциал и сосредоточиться на решении задачи.

Социальный заказ на образование определяется потребностями государства, общества и социальных групп. В связи с этим социальный заказ на творческих людей, способных к творчеству, стремящихся к новаторству и научным достижениям, нестандартному, оригинальному мышлению, делает актуальным вопрос формирования педагогического творчества будущих учителей информатики.

Целью структурно-содержательной модели формирования педагогического творчества будущих учителей информатики является формирование у них способности к педагогическому творчеству: понимания учащимся смысла и содержания педагогического творчества; стремление студента откликнуться на формирование педагогического творчества. Творчество и инновации являются неотъемлемой частью процесса обучения и основой всех дисциплин. Они являются важным аспектом того, как учить в процессе. Кроме того, творчество и инновации имеют решающее значение для учителей, повышающих свою профессиональную квалификацию. В плане творчества преподаватели играют важную и ключевую роль в вузах, так как обеспечивают организационную поддержку инноваций и творчества в учебном процессе. Высокий уровень творчества преподавателей способствует развитию студентов - повышению их компетентности и востребованности на рынке труда. Однако если существует большая разница между высоким уровнем креативности учителя и низким уровнем восприятия учащихся, то высокая креативность педагога оказывает негативное влияние. Кроме того, к факторам, которые могут оказывать негативное влияние, относятся: иррационализм с одной или обеих сторон; отсутствие конструктивизма, низкий уровень коммуникативных навыков педагога; отсутствие обратной связи в процессе обучения и др. Рассмотренные мировые тенденции развития образования носят общий характер. Кроме того, появляются новые тенденции развития различных видов и уровней образования в зависимости от их целей, особенностей, характера реализации и новых социальных требований к уровню подготовки соответствующих выпускников.

Ключевые слова: творчество, педагогическое творчество, модель, метод, компонент, развитие.

Introduction

Today, humanity is facing a new industrial revolution, which means the unprecedented rapid development and spread of major technological innovations. Important integration processes for the

ISSN-p 2306-7365
ISSN-e 2664-0686

world education system justify the relevance of the modernization of higher education. Modern society requires a qualitatively new level of bachelor's degree training from high school, taking into account the needs of industry in the digital economy. In the system of vocational training of future specialists, much attention is paid to the convergence of vocational education with real production, which provides a practical orientation of the educational process in higher education institutions. To do this, it is necessary to work closely with organizations, to learn to predict the situation for 10–15 years. According to experts from many countries, the need to modernize higher education is due to a number of similar reasons for different countries.

First, by accelerating scientific and technological progress, accelerating the pace of accumulation of knowledge, the dependence of the pace of development of society on the level and scope of education will increase. In this case, higher education will be universal, and the conditions of education must ensure its high quality.

Second, the economic and social role of higher education institutions and their graduates will increase in the complex and contradictory process of the gradual transition of society from the industrial phase of economic development to the knowledge economy and the formation of information civilization. Universities enter the economy, and scientific and technological progress and economic development are often determined by the saturation of the economy with specialists.

Third, with the formation of the world information civilization, there is a process of globalization, the convergence of the quality of education in different countries, the readiness of young people, in particular, international mobility of graduates and students, their employment and compliance with some common criteria and standards. The internationalization of education is underway.

Fourth, with limited financial resources and rapidly obsolete material and technical training base, the question of the existence of countries in the world of technologically, economically and culturally developed countries is acute.

For the improving the level of higher professional education, large-scale organizational, educational, methodological and research work is carried out. Modern trends in the development of the education system place high demands on future teachers to adapt to a professional pedagogical environment, able to solve their professional problems.

The purpose of pedagogical research is to find commonalities in a number of individual pedagogical phenomena or processes, to delve into their essence, to reveal the laws of their origin, existence and development. The study of the whole object of pedagogical being (a group of phenomena or processes or a set of them) will be possible in the context of a specific field of pedagogical knowledge and the use of a set of methods of pedagogical science [1, 68].

An analysis of the literature related to the concept of model shows that the meaning of this concept is defined differently. In the Great Soviet Encyclopedic Dictionary, “a model is a standard as well as the design, brand, model of any product” [2].

According to the encyclopedia of the humanities: a model is a form of representation of a certain fragment of reality (object, phenomenon, process, situation), original, abstract (imaginary or as a sign) or material (subject), containing important properties of the object [3].

In the psychological dictionary, “model” means the concept of modeling the learning process. Modeling the learning process consists of two aspects: “1. acquisition of knowledge in the learning process, 2. element of the learning process” [4].

Iu.E. Khokhlov defines the model as a real abstract concept in any form (for example, mathematical, physical, symbolic, graphic or descriptive), which allows to present certain aspects of reality and get answers to the studied questions [5].

A.N. Dakhin emphasizes that “as a research tool, the model should be accessible and accessible for relations, signs, facts, relationships, analysis and conclusions in a particular field of knowledge in a simple and visual form” [6].

ISSN-p 2306-7365
ISSN-e 2664-0686

The model in the logic and methodology of science – the equivalent, scheme, structure, symbolic system, the formation of human culture, conceptual theoretical structures of a particular fragment of natural or social reality. This alternative serves to expand the knowledge of the original, ie pedagogical monitoring, its design, modification or management [7].

The model should be focused on the implementation of the ideas embedded in it. In this regard, the researcher M. Vartofsky concluded: "On the one hand, the model is the realization of the idea, and on the other hand, it is a dynamic tool for the realization of the idea" [8].

"There is the following classification of models in the scientific literature: physical (similar in nature to the original); material-mathematical (their physical nature differs from the prototype, but the original may have a mathematical description of the behavior); logical-semiotic (composed of special symbols, symbols and structural diagrams)" [9].

We believe that the model should be conceptually important, acting as a link that combines deductive laws with facts. This is the most important dimension of modeling [10].

The concept of "model" is closely related to the concept of "modeling", which means the process of creating a model. Researching the work of modeling in education, V.M. Ananishnev divides analytical models of the educational process into five groups [1, p. 72].

Modeling as a universal form of cognition is used in the study and transformation of phenomena in any field of activity, it is the most common method of studying objects of various natures, including objects of complex social systems. In modern pedagogy, the term "model" is defined both as a system and an artificial model, as an alternative to a natural or social phenomenon [11].

In the process of modeling there is an interaction of four "participants": 1) the subject as the initiator of modeling and / or user of its results; 2) the original object in which the modeling problem operates, and this is the system that the entity intends to build and / or want to use in the future; 3) a model as an image of a real phenomenon; 4) the environment in which all participants in the modeling process are located and interact.

Modeling in pedagogy is the creation of models, copies of pedagogical materials, phenomena and processes. Used for graphic representation of the studied pedagogical systems. A "model" is defined here as a system of objects or symbols that derive some of the basic properties of the original, which can be replaced by a study.

The model provides for a significant simplification of the original, which makes it much easier to study it. The modeling method has three aspects:

- epistemological, ie the representation of the visual form and content of the object by its substitute model;
- logical, ie a set of operations and methods of thinking, conclusions that determine the relationship between the model and the original,
- functional, ie the role of the model in data collection, systematization and interpretation, which determines its heuristic function [12].

Research methods

The methods of scientific and pedagogical research used by us during the practical experiment in the formation of pedagogical creativity of future teachers of computer science are methodological, theoretical and didactic. In the experimental experiment we used the following methods to determine the independent and dependent variables: theoretical; questionnaire-diagnostic; Methods of mathematical statistics.

Despite the different interpretations, when defining the concept of the model, many authors note the following features:

· modeling and reproduction of the object, process under study;
· ability to replace a recognizable object, process;

ISSN-p 2306-7365
ISSN-e 2664-0686

· ability to provide new information (new knowledge about the object); availability of specific conditions and rules for modeling and transition from model information to object information.

It is necessary to strike a balance between traditional and innovative learning technologies in education. The inclusion of a creative component in the learning process should not harm traditional teaching methods, whose role in the formation of knowledge, skills and abilities is indisputable.

Improving the quality of vocational education is a topical issue not only for Kazakhstan but also for the world community. It should be noted that the solution to this problem depends on the modernization of the content of education, first of all, the system of higher professional education. This is due to the fact that qualified, competent specialists in the field of education must provide teachers who are able to adapt to the rapidly changing requirements of today, ready for dialogue and cooperation, ready to make responsible decisions in pedagogical activities.

Creative learners can be developed only through practical activities by involving them in the production of creative ideas. The main task of the teacher is to help students understand this activity and control it. This can only be done through the use of certain methods and skills related to a particular type of activity, but there are universal features of creative activity that need to be introduced to learners.

In the study of the formation of pedagogical creativity of future teachers of computer science, the method of modeling was chosen as one of the research methods. The structural and content model of the formation of pedagogical creativity of future teachers of computer science is considered as a whole system divided into several sections, components, subsystems.

The methodology of formation of pedagogical creativity of future teachers of computer science includes traditional lectures, lectures based on the idea of the problematic nature of teaching, consulting lessons, etc. was implemented. This was achieved, first of all, in achieving the goals of studying the content of theoretical knowledge, the formation of motivation, the formation of pedagogical creativity of future teachers of computer science. In the formation of pedagogical creativity of future teachers of computer science is important to stimulate pedagogical creativity, including diagnostic, emotional, perceptual-group, action components.

Comparative analysis of models for the formation of pedagogical creativity of future teachers of informatics involves examining and contrasting different approaches, strategies, and methodologies aimed at fostering creative teaching skills among prospective computer science teachers.

Models for Pedagogical Creativity Formation

a. Divergent Thinking Model:

This model emphasizes fostering divergent thinking skills through brainstorming, ideation, and problem-solving exercises. It encourages teachers to explore a variety of teaching methods, approaches, and technological tools to engage students creatively.

b. Design Thinking Model:

Design thinking involves a human-centered approach to problem-solving, emphasizing empathy, ideation, prototyping, and testing. Future informatics teachers learn to design innovative and student-centric learning experiences through this approach.

c. Project-Based Learning Model:

Project-based learning encourages teachers to design and facilitate hands-on projects that address real-world problems. It promotes interdisciplinary thinking, collaboration, and the integration of technology in creative ways.

d. Flipped Classroom Model:

The flipped classroom model involves reversing traditional teaching methods. Future teachers create interactive, technology-based resources for students to learn independently outside of class, allowing in-class time for collaborative activities, discussions, and creative projects.

e. Inquiry-Based Learning Model:

ISSN-p 2306-7365
ISSN-e 2664-0686

Inquiry-based learning focuses on student-driven exploration and investigation. Future teachers develop skills to guide students in asking questions, conducting research, and creatively solving problems related to informatics.

Compare and contrast the selected models based on various parameters:

a. Theoretical Foundation:

Examine the theoretical underpinnings of each model. How do they align with educational psychology and creativity theories?

b. Emphasis on Creativity:

Evaluate how each model prioritizes the development of pedagogical creativity. Which aspects of creativity do they target (e.g., originality, flexibility, elaboration)?

c. Integration of Informatics:

Analyze how well each model integrates informatics concepts and technologies. Do they effectively leverage technological tools for creative teaching?

d. Teacher Role and Training:

Consider the role of future teachers in each model. How are they prepared and trained to implement these models effectively? Do they require specialized training in technology integration?

e. Student Engagement:

Examine how the models promote student engagement in the informatics learning process. Do they encourage active participation, critical thinking, and problem-solving?

f. Assessment and Evaluation:

Discuss how each model addresses the assessment of creative teaching skills. How do they measure the success of pedagogical creativity formation?

Results

The target component of the model includes a system of goals and objectives for the formation of pedagogical creativity of future teachers of computer science. It forms a component system and acts as a manager for other components; serves as a determining factor in the development of their content. As a result of creating a structural and content model, we have identified the goal of forming the pedagogical creativity of future teachers of computer science.

Motivational component provides for the formation of sustainable motives for future teachers in connection with the formation of pedagogical creativity (perception of pedagogical creativity in terms of individual psychological qualities; ability to show creativity in problem situations, the desire to act).

Motivation is the process of initiating and strengthening goal-based action. Motivational actions include taking on the task, physical and mental exertion, overcoming difficulties and achieving success [13].

Creating positive motivation for future teachers of computer science to form pedagogical creativity is a very difficult task. It is necessary to create positive motives for students, because the success of their formation of pedagogical creativity often depends on it. This is reflected in the principle of consciousness and activity of students. In this sense, consciousness is reflected in the positive attitude and interest of students in the formation of pedagogical creativity, and their activity is the presence of a goal (according to the psychological theory of action, the goal is formed when there is a motive that is “established need”).

In the formation of pedagogical creativity, there are often two types of motivation - internal and external. Intrinsic motivation – motivation or inner desires that are satisfied as a result of the task. Externally motivated after we solve the problem

Cognitive component – involves the formation of psychological, pedagogical, social, cognitive knowledge necessary for the formation of pedagogical creativity of future teachers of computer science.

ISSN-p 2306-7365
ISSN-e 2664-0686

Cognitive component is the result of the process of cognitive activity. The content of the cognitive component in the structural-content model of formation of pedagogical creativity of future teachers of computer science determines the need for his professional knowledge in this area, knowledge of creativity, pedagogical creativity and its components and ways to express pedagogical creativity in professional activity. Evaluation-effective parameters, including criteria and indicators of the level of readiness, in particular, its cognitive component, are important in revealing the features of the formation of the cognitive component. The cognitive component in the formation of pedagogical creativity of future teachers of computer science combines indicators that characterize the overall level of formation of pedagogical creativity.

The purpose of the structural and content model of the formation of pedagogical creativity of future teachers of computer science, methodological principles and principles of formation of pedagogical creativity, structural components and pedagogical creativity, the content of pedagogical creativity, the formation of pedagogical creativity.

Let's consider criteria and indicators of formation of pedagogical creativity. The research does not specify the uniformly accepted definitions of “measurement” and “indicator”. According to II Monakhov, “dimension” is a sign on the basis of which a true pedagogical phenomenon, quality or process can be compared and evaluated with a standard [14].

According to Taubayeva Sh.T. control, implementation of the established amount of knowledge, skills, abilities, behavior, formed in the practice of the student [1, p. 142].

In this sense, the measurement is the qualities, properties, characteristics that indicate the state of the object of study. Indicators - quantitative and qualitative characteristics of each quality, properties, formation of the sign of the object of study (Table 1). This is a measure of the formation of the criterion.

Table 1 – Criteria and indicators for the formation of pedagogical creativity of future teachers of computer science

Component	Dimensions	Indicators
Motivational	Interest of future computer science teachers in pedagogical activity, professional growth, formation of pedagogical creativity	professional motives and their dominance, levels of development of learning motivation; The ratio of motivation to success, motivation of students to learn and adapt; interest in the formation and development of pedagogical creativity;
Cognitive	Knowledge of pedagogical creativity of future computer science teachers	knowledge of the essence, content and components of pedagogical creativity; knowledge of methods of formation of pedagogical creativity.
Effective	Realization of pedagogical creativity	self-actualization of the person; Creativity of students in solving pedagogical situations; make new decisions on issues arising in the pedagogical process;

One of the most important scientific issues is to determine the criteria for the formation of pedagogical creativity of future teachers of computer science. The identified criteria allow to draw conclusions about the predicted, positive achievements of pedagogical activities.

Basic requirements for the criteria [15]:

- the criteria are adequate to the phenomenon they are measuring;

ISSN-p 2306-7365
ISSN-e 2664-0686

- Criteria must describe the relationship between them and learning outcomes in accordance with the didactic objectives;

- Criteria are expressed in terms that can be applied to quantitative analysis; criteria provide relative simplicity of measurement, ease of calculation, accessibility and convenience of use;

- Criteria allow to assess the quality of knowledge, business and skills, learning outcomes, as well as the creative work of students.

The study of theoretical and practical results of consideration of the problem of formation of pedagogical creativity of future teachers of computer science became the basis for distinguishing three levels of this problem (high, medium and low):

1. Low level - low interest in creativity, pedagogical creativity. Little effort to be creative. Low level of education in terms of pedagogical creativity. They do not pay attention to the importance of pedagogical creativity for the future teacher. Not active in group activities. Difficult to make decisions on their own. Low pedagogical creativity in critical situations. Does not seek to analyze his actions in terms of creativity, low self-esteem.

2. Intermediate level – they have an interest in pedagogical creativity. Strives to be creative, but there are shortcomings in understanding its meaning and social significance. Knows the types of creativity. He also knows what a creative teacher does. However, the ability to demonstrate the concepts they know in everyday practice is moderate. He has a good knowledge of practical skills in this area, but his normal presentation requires additions. Their self-confidence is average, so they can't significantly influence other members of the group. Has a strong desire to make their own decisions. Can also be active in a group. And in group activities it is not so noticeable. Although he understands his own actions, he relies on the help of others in the analysis and evaluation.

3. High level – a clear interest in pedagogical creativity. He understands that this is due to the needs of society, the social order. Can directly influence the group, knows his friends early. Shows courage and energy in critical hours. I tend to come up with new ideas, to express my ideas in convincing sentences. He is fully responsible for his actions, independently analyzes and evaluates them.

Having considered the proposed models in other scientific works that studied pedagogical creativity, we clarified the difference of our model. If creative pedagogy was developed in previous works, etc. e. the problem of the creativity of the pedagogical process is proposed in our prepared model in accordance with the combination of the teacher's creativity with pedagogical knowledge and skills.

The following levels of pedagogical modeling can be distinguished: conceptual modeling (development of a conceptual model of a new type of management of the educational institution, a model of development of personality traits of the student in the pedagogical process, etc.); system modeling (development of a system of interconnected models of different pedagogical objects) In the process of modeling, the system approach provides a chain of many facts about the pedagogical phenomenon obtained by traditional means using different models into a single whole, describing the complexity of the object under study; procedural modeling (creation of dynamics of models reflecting the logic of development of the studied object); praxiological modeling (model of practical results of the teacher's activity or its interaction).

Discussions

The indicator of the higher education effectiveness is internationalization of it and the fact that higher education institutions are reflected in world rankings. During the implementation of the program for 2016–2019, the share of foreign students in higher education increased to 4%. Kazakhstan's higher education institutions were first recognized by the Times Higher Education rating publication. The number of Kazakhstani universities marked in the QS WUR rating has reached 10. However, according to the WEF GPI-2019 “Graduate Skills” indicator in higher

ISSN-p 2306-7365
ISSN-e 2664-0686

education, Kazakhstan ranks 95th out of 141 countries. The survey showed that 70% of employers are dissatisfied with their skills. At the same time, employment of graduates of colleges and higher education institutions is monitored on the basis of statistics and does not provide feedback from graduates. The quality of higher education influences the outflow of students to foreign higher education institutions. Over the past 7 years, the number of students going abroad in Kazakhstan has doubled. More than 100 thousand Kazakhstanis study in 130 countries around the world.

To address these problems, it is necessary to develop a common approach to vocational guidance, training and involvement of employers in the process of internationalization of vocational education.

In this regard, it is important to involve stakeholders in education. The first mention of the concept of "interest of the parties" was in the speeches of R. Stewart, N. Adlen and M. Docher in 1963, who used the old Scottish term "stakeholder" in the sense of "legitimate claimant to anything of value". Later, E. Freeman [16] in his monograph "Strategic Management: Stakeholder Approach" (1984) proposed the theory of stakeholders. The interest (benefit) of the external and internal environment plays an important role in the English language data. Stakeholders are those who are interested in the success of a project, system, or organization, such as a company employee or the parent of a school child, and so on. Abroad, in general, standards for interaction with stakeholders have been developed. The most popular stakeholder interaction standard (AA1000SES) developed by the Account Ability Institute. Accordingly, the basis for interaction with stakeholders should be three principles:

1) materiality - the organization must know what its stakeholders are, as well as how important its interests and the interests of stakeholders are to it;

2) completeness - the organization is required to understand the views, needs, threats and expected results of activities, as well as their views on issues important to them;

3) response - the organization must consistently respond to significant issues facing stakeholders and the organization.

Students from 5B011100, majoring in Computer Science, took part in the experiment. A total of 102 students took part in the experiment. The control group included 52 students, the experimental training group - 50 students.

Quantitative and qualitative analysis of the results of the control period for the formation of pedagogical creativity of future computer science teachers shows that students have a positive attitude towards educational and professional activities. In terms of the development of the motivational component, the high rate in the experimental group reached 48% (24 people), and in the control group this figure was 28% (15 people).

An analysis of the level of formation of the structural components of pedagogical creativity of future computer science teachers before and after the experiment led to the conclusion that the use of creative teaching technologies focused on the individual has a positive effect on the effective level of what is desired. problem.

The indicators of all structural components in the experimental group (the high level of formation of pedagogical creativity of future computer science teachers increased by 34%, the low level decreased by 21%) are higher than the indicators of the control group.

Conclusion

The results obtained during practical and experimental work allowed us to draw the following conclusions:

- the above structural and content model and methodological systematic work on its implementation make it possible to effectively organize the formation of pedagogical creativity of future computer science teachers;

ISSN-p 2306-7365
ISSN-e 2664-0686

- it is possible to increase the level of formation of pedagogical creativity of future computer science teachers within the framework of a special methodology;

- the introduction of methods for the formation of pedagogical creativity of future computer science teachers into pedagogical practice influences the achievement of positive results in the development of the personality of the future creative teacher, in addition to the formation of the creativity being studied.

In short, the results of practical and pedagogical work prove the correctness of our direction and the consistency of our structural and content model and the research results. Thus, we can conclude that the hypothesis of our study was confirmed. The methodological system, implemented with the aim of shaping the pedagogical creativity of future computer science teachers, has shown its effectiveness in shaping the pedagogical creativity of students. Positive changes have occurred in the formation of pedagogical creativity.In conclusion, it should be noted that the pedagogical creativity formation of future teachers of computer science is the main, integrated quality of professionals who are interested in professional activity, striving for self-improvement, training and quick decision-making, adapting to new aspects and conditions of forced professional activity.

BIBLIOGRAPHY

1. Таубаева Ш.Т. Педагогика әдіснамасы: оқу құралы. – 2-бас. – Алматы: Қарасай, 2016. – 432 б.
2. Большой энциклопедический словарь / ред. А.М. Прохоров. – М.: Советская Энциклопедия, 1991. – 941 с.
3. Стёпин В.С., Ивин А.А., Голдберг Ф.И. Модель / Гуманитарная энциклопедия: Концепты // Центр гуманитарных технологий, 2002–2020 (последняя редакция: 08.02.2020). [Electronic resource]. URL: https://gtmarket.ru/concepts/7024 (date of access: 31.10.2019).
4. Краткий психологический словарь / Под общ. ред. А.В. Петровского, М.Г. Ярошевского, ред.-сост. Л.А. Карпенко. – 2-е изд., расш., испр. и доп. – Ростов-на-Дону: Феникс, 1998. – 512 с.
5. Глоссарий по информационному обществу / Под общ. ред. Ю.Е. Хохлова. – М.: Институт развития информационного общества, 2009. – 160 с.
6. Дахин А.Н. Педагогическое моделирование: сущность, эффективность и … неопределенность // Педагогика. – 2003. – № 4. – С. 21–26.
7. Абакумова Н.Н. Система мониторинга в образовании: учеб. пособие. – Томск: Издательский Дом Томского государственного университета, 2018. – 140 с.
8. Вартофский М. Модели. Репрезентация и научное понимание. – М.: Прогресс, 1988. – 508 с.
9. Богатырев А.И., Устинова И.М. Теоретические основы педагогического моделирования (сущность и эффективность). [Electronic resource]. URL: http://www.rusnauka.com/SND/Pedagógica/2_bogatyrev%20a.i.. doc.htm (date of access: 19.03.2018).
10. Капке В.А. Методология научного познания: учебник для магистров. – 2-е изд. стер. – М.: Омега-Л, 2014. – 255 с.
11. Непрокина И.В., Болотникова О.П., Ошкина А.А. Безопасная образовательная среда: моделирование, проектирование, мониторинг: учеб. пособие. – Тольятти: Изд-во ТГУ, 2012. – 92 с.
12. Каратаев Г.С. Болашақ информатика мұғалімдерінің функционалды құзіреттілігін қалыптастырудың ғылыми-педагогикалық негіздері: PhD … дисс. – Астана, 2017. – 172 б.
13. Дейл Х. Шунк. Оқыту теориясы: Білім берудің келешегі. – 7-бас. – Алматы: «Ұлттық аударма бюросы» қоғамдық қоры, 2018. – 468 б.
14. Педагогические технологии В.М. Монахова в образовательном пространстве г.о. Тольятти // Сборник трудов II науч.-практ. конф. – М.; Тольятти: МГГУ им. М.А. Шолохова, 2008.
15. Омельченко Е.В. Культура речи и риторика: учеб.-практич. пособие. – Челябинск: Изд-во Юж.-Урал. гос. гуман.-пед. ун-та, 2016. – 114 с.
16. Булатов А.Р. Эдвард Фриман. Люди. [Electronic resource]. URL: http://www.peoples.ru/science/philosophy/r__edward_freeman/ (date of access: 31.10.2019)

ISSN-p 2306-7365
ISSN-e 2664-0686

REFERENCES

1. Taubaeva Sh.T. Pedagogika adisnamasy [Pedagogical methodology]: Oku kuraly. – 2-bas. – Almaty: Karasai, 2016. – 432 b. [in Kazakh]
2. Bolshoi enciklopedicheskiy slovar [Large encyclopedic dictionary] / red. A.M. Prohorov. – M.: Sovetskaia Enciklopedia, 1991. – 941 c. [in Russian]
3. Stiopin V.S., Ivin A.A., Goldberg F.I. Model [Model]./ Gumanitarnaya enciklopediya: Koncepty [Electronic resource] // Centr gumanitarnyh tekhnologiy, 2002–2020 (posledniaia redakcia: 08.02.2020). [Electronic resource]. URL: https://gtmarket.ru/concepts/7024 (date of access: 31.10.2019) [in Russian]
4. Kratkiy psihologicheskiy slovar [Brief psychological dictionary] / Pod obsh. red. A.V. Petrovskogo, Pod obsh. red. M.G. Yaroshevskogo, Red.-sost. L.A. Karpenko. – 2-e izd., rassh., ispr. i dop. – Rostov-na-Donu: Feniks, 1998. – 512 s. [in Russian]
5. Glossarij po informacionnomu obshchestvu [Glossary on the information society] / Pod obsh. red. Iu.E. Hohlova. – M.: Institut razvitia informacionnogo obshestva, 2009. – 160 s. [in Russian]
6. Dahin A.N. Pedagogicheskoe modelirovanie: sushnost, effektivnost i … neopredelennost [Pedagogical modeling: essence, effectiveness and... uncertainty] // Pedagogika. – 2003. – № 4. – S. 21–26. [in Russian]
7. Abakumova N.N. Sistema monitoringa v obrazovanii [Monitoring system in education]: ucheb. posobie. – Tomsk: Izdatelskiy Dom Tomskogo gosudarstvennogo universiteta, 2018. – 140 s. [in Russian]
8. Vartofskiy M. Modeli. Reprezentacia i nauchnoe ponimanie [Models. Representation and scientific understanding]. – M.: Progress, 1988. – 508 s. [in Russian]
9. Bogatyrev A.I., Ustinova I.M. Teoreticheskie osnovy pedagogicheskogo modelirovania (sushnost i effektivnost) [Theoretical foundations of pedagogical modeling (essence and effectiveness)]. [Electronic resource]. URL: http://www.rusnauka.com/SND/Pedagógica/2_bogatyrev%20a.i.. doc.htm (date of access: 19.03.2018). [in Russian]
10. Kapke V.A. Metodologia nauchnogo poznania [Methodology of scientific knowledge]: uchebnik dlia magistrov. – 2-e izd. ster. – M.: Izdatelstvo «Omega-L», 2014. – 255 s. [in Russian]
11. Neprokina I.V., Bolotnikova O.P., Oshkina A.A. Bezopasnaia obrazovatelnaia sreda: modelirovanie, proektirovanie, monitoring [Safe educational environment: modeling, design, monitoring]: ucheb. posobie. – Toliatti: Izd-vo TGU, 2012. – 92 s. [in Russian]
12. Karataev G.S. Bolashaq informatika mugalimderinin funkcionaldy quzirettiligin qalyptastyrudyn gylymi-pedagogikalyq negizderi [Scientific-pedagogical bases of formation of functional competence of future informatics teachers]: PhD … diss. – Astana, 2017. – 172 b. [in Kazakh]
13. Deil H. Shunk. Oqytu teoriasy: Bilim berudin keleshegi [Learning theory: The future of education]. 7-basylym. – Almaty: «Ulttyk audarma biurosy» qogamdyq qory, 2018. – 468 b. [in Kazakh]
14. Pedagogicheskie tehnologii V.M. Monahova v obrazovatelnom prostranstve g.o. Toliatti [Pedagogical technologies V.M. Monakhov in the educational space of the city. Togliatti] // Sbornik trudov II nauch.-prakt. konf. – M.; Toliatti: MGGU im. M.A. Sholohova, 2008. [in Russian]
15. Omelchenko E.V. Kultura rechi i ritorika [Culture of speech and rhetoric]: ucheb.-praktich. posobie. – Cheliabinsk: Izd-vo Iuj.-Ural. gos. guman.-ped. un-ta, 2016. – 114 s. [in Russian]
16. Bulatov A.R. Edvard Friman. Liudi [Edward Freeman. People]. [Electronic resource]. URL: http://www.peoples.ru/science/philosophy/r__edward_freeman/ (date of access: 31.10.2019) [in Russian]