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PROCESS MODEL OF PEDAGOGICAL SUPPORT FOR TEACHERS OF THE FUTURE

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Abstract

The problems of interaction of science as a social institution with society and the state, along with issues related to the dissemination of scientific knowledge in a non-scientific environment, today become more relevant than ever before. Popularisation as a form of presenting scientific knowledge to a wide audience has become an independent sphere and field of activity of pedagogical universities. In the focus of attention of the authors of this study is pedagogical support for the teacher of the future in the field of popularisation of science as one of the priority tasks in ensuring the qualitative development of modern society. This also involves the formation of the general culture of the graduate of the university and intellectual abilities for competent actions in professional activity. The constructed process model of pedagogical support for the teacher of the future reflects a set of interrelated structural blocks. They are target methodological, substantive. The last one is productive (the expected result, oriented to the formation of cultural and enlightenment of the teacher of the future). The process model is set by the content of scientific approaches (cultural, competence, activity) and their corresponding principles (axiological, subjectivity, cultural creation, science-intensive, cooperation and partnership, research reflection). It allows actualising the mechanism of social partnership of educational and cultural organisations (value orientation – stable semantic attitudes – constructive parity relations – activation of subject-subject interaction – prognostic).

Keywords: Cultural and educational competences, process model, pedagogical support, popularisation of science, teacher of the future

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1. Introduction

The study of the phenomenon of popularisation of science in recent years has been conducted by scientists in a number of directions. The statement of the "emergence of science" outside scientific institutions and academic communities becomes a kind of intellectual leisure, which, as it turns out, is now in great demand among student youth (Bowler, 2015). The analysis of new challenges in the field of popularisation of scientific knowledge and related ethical problems of communication establishes a clear code of conduct that provides truthful information to listeners (Li & Ma, 2021). There are ways of popularising science, creating effective innovative communications in society with the involvement of scientists who are ready to bring scientific knowledge into a popular format, adapting the content of scientific problems to the level of understanding of the general public (Aladyshkin et al., 2019; Osipova & Yarulov, 2023; Podaneva, 2017).

The fundamentally new information landscape of the globalisation era, the avalanche-like spread of knowledge-intensive technologies, digital transformation of education and other trends unfolding in the socio-economic environment require the search for new models of pedagogical support for teachers of the future in the field of science popularisation (Ivanishcheva et al., 2022). Multidimensional and competently organised education becomes one of the equally important guarantees of a prosperous, sustainable social and economic future of the state, which is obliged to take care of preserving and increasing its competitiveness. Purposeful preparation of the teacher of the future for educational activity is carried out as a rule in the process of professional education (Morozova, 2017; Semikopov & Zakhryapin, 2023). However, this is no longer sufficient for readiness to conduct productive educational work in the Decade of Science and Technology announced by the Decree of the President of the Russian Federation. This document actualises the growing importance of Russian scientists in scientific, technological and digital breakthroughs to position Russia as the world's most powerful nation.

The extraordinary increase in the information and communication exchange, the rapidity of the spread of inaccurate, inaccurate or false information (increase in the amount of near-scientific or pseudoscientific content on the Internet) actualises scientific substantiation of the process model of pedagogical support for the teacher of the future in the field of science popularisation obvious. This organisational structure is designed to promote the involvement of the teacher of the future in popularisation activities to broadcast the achievements of science and technology to a mass audience, to stimulate the influx of young people into the sphere of science, education and high technology (Prishchepa, 2019).

The potential of the educational process of professional training in higher education provides the development of the necessary competences of the new image of a teacher. Professional training is aimed at mastering by the teacher of the future a variety of activities: educational, quasi-professional, research, practical, self-educational, etc. According to the Federal State Educational Standard of Higher Education, a bachelor's degree graduate in the training direction of "Pedagogical Education" should be ready to implement cultural and educational activities. They include studying forms of needs of children and adults in cultural and educational activities; organize cultural space; developing and implementing cultural and educational and programs for various social groups. Consequently, readiness for professional

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popularisation activity is the result of higher education aimed at transforming and improving the surrounding reality.

2. Problem Statement

Unfortunately, today we have to state the absence of a process model of pedagogical support for the teacher of the future in the field of science popularisation. This should be based on the implementation of a comprehensive package of educational programmes and socially significant projects, as well as on the activities of pedagogical universities designed to ensure the formation of cultural and educational competencies.

3. Research Questions

The subject of the article is the problematic of pedagogical support for the teacher of the future in the field of popularisation of science, aimed at creating effective interaction, assistance and support to the subject of education. These are expanding ideas about the popularisation of scientific knowledge in terms of the process and result of the development of scientific way of thinking, readiness of the student to conduct interdisciplinary research and solve the problems of project activity; comprehension of the value of scientific knowledge and its broadcasting as a special type of mass.

4. Purpose of the Study

The aim of the article is to scientifically substantiate the process model of pedagogical support for the teacher of the future in the field of popularisation of science as an organisational and technological basis for increasing the competitiveness of higher education institutions that act as providers of scientific innovations in the education system.

5. Research Methods

The following methods were used in the work: analysis and generalisation of scientific, pedagogical, methodological literature and normative documents; modelling; comparative-comparative and logical types of analysis of educational practice, the concept of which was comprehended on the basis of cultural, competence and activity methodological approaches.

The conducted research involves the norms of legislative regulation prescribed in the Law on Educational Activities in the theoretical understanding of scientific-popularisation activities.

6. Findings

When developing the process model of pedagogical support for the teacher of the future in the field of popularisation of science, we followed the general requirements for model creation and modelling stages described by I. O. Kotlyarova and G. N. Serikov. These are 1) model construction; 2) theoretical

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study of the model; 3) model testing; 4) control of modelling results and correction of the model; 5) presentation of the finalised version of the model (Burlutskaya, 2022).

The process model of pedagogical support for the teacher of the future in the sphere of popularisation of science is represented by the totality and interdependence of target, methodological, content and result blocks.

The target block of the model represents the goals and objectives of pedagogical support as a process of encouraging the teacher of the future to acquire and transfer scientific knowledge to a wide audience in a popular form. This allows us to outline the guidelines for achieving a new quality of teacher training in higher education in accordance with the social order of the state, normative legal documents in the field of education and science, the requirements of all participants of educational relations. The Concept of the training of pedagogical staff for the education system for the period up to 2030 outlines the need to activate the research agenda in the field of education, taking into account the national goals and objectives of the country's development, modern directions of scientific and technological development.

The methodological block of the model is based on the provisions of scientific approaches and principles that allow providing pedagogical support for the teacher of the future in the field of popularisation of science. Let us consider them in detail.

The cultural approach (V.L. Benin, E.V. Bondarevskaya, O.S. Gazman, N.B. Krylova, N.E. Shchurkova, et al.) allows us to carry out pedagogical support for the teacher of the future through the prism of the concept of culture, fills it with personal meanings, the ability to cultural self-development. A pedagogical university acts as a holistic cultural and educational space in which, on the one hand, the individual and personal formation of an adult as a subject of culture takes place in the process of acquiring life (social) and professional experience. On the other hand, this is a preparation for the transmission of "objective knowledge about the world", the dynamics of socio-cultural traditions, achievements in various fields of science.

In the study, the cultural approach is realised based on a number of principles:

i. an axiological principle reflects the guidelines of pedagogical support for the teacher of the future within the framework of awareness of personal and social meanings of the purpose of science popularisation. This involves formation of a value attitude to the ways of solving scientific problems, translation of modern achievements of science and technology, development of social responsibility for the proposed innovative solutions of popularisation activity. The activation of the future teacher's need for lifelong learning, i.e. mastering the values of personal self-development and self-improvement, taking into account the increasing science intensity and technologicalisation of all spheres of society's life, is especially significant;
ii. a principle of cultural creativity is expressed in the enrichment of the experience of cultural creativity in the organisation of a unified cultural space by university teachers and students in the classroom in the variability of cultural practices (the basis of which are the values of cultural acquisition, cultural creation, cultural transmission). These promote cultural self-development, mastering cultural norms and patterns of polarising

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activities, increasing cultural sensitivity to the coverage of the ideas of scientific and technological progress and innovation, analysis and use of the ideas of scientific and technological progress and innovations.

The competence approach (Vitvinchuk, 2021) is aimed at the results of the formation of cultural and educational competences in the process of mastering the basic professional educational programme. It is dominated not by the idea of building up the volume of knowledge, but by the acquisition of versatile experience in popularising science (Schaefer et al., 2021). This determines the objective necessity of purposeful work of the whole system of pedagogical education to prepare the teacher of the future not just possessing certain knowledge and skills, but also possessing specific personal properties, able to make the right decisions, to show independence and critical thinking, responsibility and initiative. This also involves using a variety of techniques, methods and means of teaching and education, being highly willing and able to show attention to the problems associated with the achievement of learning and education, being ready and able to pay attention to the problems associated with the achievement of the highest level of knowledge and skills.

The implementation of the process model is based on the following principles of the competence-based approach:

i. the principle of science intensity reflects the construction of pedagogical support for teachers of the future based on understanding the social role of science and its mass popularisation for disseminating cultural and educational values, awareness of responsibility as a representative of the scientific community for translating scientific achievements and pedagogical experience. There is also social and cultural progress, the main ideas of modernisation of the education system, taking into account the use of reliable resources of representatives of research and educational organisations, museums, and other institutions.
ii. the principle of cooperation and partnership determines the importance of pedagogical support for the development of skills in interactive dialogue between the researcher (teacher of the future) and interacting parties (different categories of the population) within the framework of popularization activities in the coordination of mutual interests. This implies synchronization of vision of common ways of exchanging ideas, meanings, experience, expansion of the field of possible actions, events, situations and development of their own unique creative style of cultural unity, storage, transmission

The activity approach (B.G. Ananyev, V.V. Davydov, A.N. Leontiev, A.K. Markova, S.L. Rubinstein, et al.) focuses on mastering the content of education in activity, determines the leading role of the practice of popularisation of science, the development of social and pedagogical experience of cultural and educational activities by the teacher of the future. It allows integrating teaching and cognitive, research and cultural and educational activities in order to develop creative abilities, meet cultural needs and raise the cultural level of a person.

This approach implements the following principles:

i. the principle of subjectivity reflects the importance of the use of active forms and methods of organising training, where the student's research initiative is activated in

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obtaining new knowledge in the field of popularisation of science in a certain logic. From internal activity to personal growth and from them it provides a search and creative activity to master the cultural and educational heritage of society and further to the translation of the main achievements of science and technology, culture and education through the creation, promotion and implementation of creative ideas of popularisation of science and technology, culture and education

ii. the principle of research reflexion provides the development of the teacher of the future's ability to control his/her activity on popularisation of science taking into account social norms and rules, adequate use of various scientific methods to the corresponding researched and broadcast subject-object areas. There is a comprehension of the productivity of scientific design, competition, research and popularisation activity with the purpose of creating new things in the surrounding world, in his/her own life, culture as a whole.

The content block of the model reflects the main directions of this type of support (science-oriented, pedagogically-centred, research-translated), with the implementation of strategies ("orientation", "assistance", "enrichment", "scaffolding") and the implementation of conceptual and semantic attitudes of the teacher-mentor. In terms of content, it is necessary to actualise the mechanism of social partnership between educational and cultural organisations (value orientation – stable semantic attitudes – constructive parity relations – activation of subject-subject interaction – predictive reflexivity) in order to achieve the set result.

The most effective forms and measures of pedagogical support for the teacher of the future in the field of popularisation of science are popular science lectures and video lectures; popular science evenings; weeks of science and popularisation of subject areas; discussion clubs; scientific briefings; campaigning and educational brigades. These are science festivals; scientific and educational centres, research laboratories and workshops in which students can work; scientific schools; work of councils of young scientists of universities and scientific organisations with students of universities and scientific organisations; work of young scientists of universities and scientific organisations with students of the future in the field of popularisation of science.

The optimal functioning of the process model of pedagogical support for the teacher of the future is possible in the field of science popularisation against the background of the organisational conditions identified in the study. This involves increasing the prestige of the student's popularisation activity, taking into account individual capabilities and forms of organisation of interactive interaction between the support person (teacher) and the support person (teacher of the future). And second is using the potential of the scientific community to form an interest in science popularisation in the teacher of the future; enriching the pedagogical environment of the teacher of the future.

The resultant block of the process model of pedagogical support for the future teacher in the field of science popularisation reflects the system of criteria (knowledge, axiological, behavioural) and indicators, grouped by the authors, which characterise the main components of cultural and educational competences of the future teacher. Cognitive ones are assimilation of the value of scientific knowledge, aspiration to analyse the achievements and problems of Russian science, the contribution of scientific

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teams and individual scientists to the world science. Motivational components are the presence of motivation to scientific enlightenment.

7. Conclusion

Ensuring scientific and technological development of the Russian Federation requires the expansion of scientific personnel potential, support for talented young researchers, the formation of interest in science in the teacher of the future. Here one acts as a basic regulator of the progressive functioning of all spheres of modern society and the productive implementation of breakthrough, knowledge-intensive innovative technologies that ensure the raising of the prestige of professional teacher training. Pedagogical universities should undertake the mission of pedagogical support for young teachers in the field of promoting scientific knowledge and involving the widest possible range of participants in this activity. In this regard, it is particularly important to develop a process model of pedagogical support for the teacher of the future in the field of popularisation of science.

The author's process model has a regular, purposeful and controllable character in the totality of target, methodological, content, and result blocks.

The target block of the model is set by the social demand of society and the state for promoting the results of scientific research and achievements of social progress to increase the level of education and the competitiveness of the state. This includes the requirements of legal and regulatory documents for providing pedagogical support for the teacher of the future in the field of popularisation of science.

The methodological block of the author's model is set by the integrative unity of scientific approaches (cultural, competence, activity) and their corresponding principles (axiological, culture making, science-intensive, cooperation and partnership, subjectivity, research reflection).

The content block defines the content of the directions of the process model of pedagogical support for the teacher of the future in the field of science popularisation (science-oriented, pedagogically-centred, research-translated). This involves the implementation of strategies ("orientation", "assistance", "enrichment", "scaffolding") and actualisation of the mechanism of social partnership of educational and cultural organisations (value orientation – stable semantic attitudes – constructive parity relations – activation of the social partnership mechanism).

The result block of the model reflects the development of a criterion-diagnostic apparatus that allows us to evaluate the effectiveness and verifiability of the presented model on the formation of components (cognitive, motivational and activity) of cultural and educational competences and their positive level transformation.

The developed process model has the property of continuity, reveals the sequence and stage-by-stage implementation of the phenomenon under study, taking into account the integration with organisational conditions that ensure its effectiveness.

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