Pedagogical Cluster- Journal of Pedagogical Developments
PCJPD: Volume 2 Issue 11, November 2024, online: ISSN 2956-896X
PEDAGOGICAL CLUSTER
JOURNAL OF PEDAGOGICAL DEVELOPMENTS
Website: https://euroasianjournals.org/index.php/pc/index

Principles Of Methodological Training Of Physics Students Based On Subjective-Reflective Education

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Annotation:
The article highlights the principles of methodological training of physics students based on subjective-reflective learning, highlighting their importance in the future work of students.

Keywords: humanitarian-technological approach, educational strategy, coherence, cultural creativity, dialogicity, technological efficiency, practical and research-oriented nature of the process, subjectivity and reflexivity, problem-based and dialogic teaching, reflective learning.

Принципы Методической Подготовки Студентов-Физиков На Основе Субъектно-Рефлексивного Обучения

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Аннотация:
В статье рассматриваются принципы методической подготовки студентов-физиков на основе субъектно-рефлексивного обучения, подчеркивается их значимость в дальнейшей работе студентов.

Ключевые слова: гуманитарно-технологический подход, образовательная стратегия, связность, культуротворчество, диалогичность, технологичность, практико-исследовательская направленность процесса, субъектность и рефлексивность, проблемно-диалогическое обучение, рефлексивное обучение.

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Introduction

The humanitarian-technological approach to the study and development of a system of methodological training of students in physics led to the understanding of the educational strategy reflecting the subject as the basis for building a system of methodological training in modern pedagogical higher educational institutions.

This system ensures the transformation of the student into a subject of professional pedagogical activity, while complying with the requirements of the following principles of methodological training: consistency, cultural creativity, dialogicity, technological efficiency, practical and research orientation of the process; subjectivity and reflexivity (Table 7).

Table 7.

Principles and requirements for methodological training of students in physics based on a science-reflective educational strategy.

Principles	Requirements
Systematicity	- openness (transparency) of all components of the methodological training system. - systematic consideration of the goals, content, structure and components of the methodological training process of students in their unity; - systematic use of teaching methods and tools - alternative, flexible, ergonomic methods and forms of organizing activities, taking into account the cognitive characteristics of the participants in the educational process.
Subjectivity	- personal self-awareness - developing cognitive and creative independence
Reflectivity	- students' thinking in the process of organizing and carrying out educational, research, practical work

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	- systematic use of self- and mutual analysis, self- and mutual assessment methods in methodological preparation. - independent selection of educational material, tasks or means of activity
Cultural creativity	- value-semantic determination of personal and professional self-development of students and teachers - taking into account the meaning of images, ideals, norms, models of the cultural world involved in decision-making
Dialogicity	- dialogic communication with information - organization of subject-subject communication in the process of methodological preparation - problem-based and dialogic learning - organization of feedback (or reflection)
Practical orientation	- eliminate the one-sidedness of students' mental work - adherence to the sequence of educational activity itself as a quasi-professional activity educational and professional activity - professional activity of a specialist - construction of the methodological training process as research
Productivity	- goal setting, technological efficiency of planning; - organization of the methodological preparation process

The listed principles are theoretical rules that determine the content of the components of the methodological training of physics students in accordance with the educational strategy that reflects the science.

Literature analysis and methodology

Since a system is understood as a set of objects whose interaction determines the presence of integrative qualities that are not inherent in its components,

from the point of view of the principle of systematicity, the methodological preparation of physics students manifests itself in this way. The pedagogical system is a holistic object with its own components, which, through the subjective-reflexive teaching strategy, provides for a different emphasis on the production relations that make up its structure.

Theoretical understanding of this system shows that its specific organization is determined by the specific characteristics of the factor that makes up the system, which gives a general focus to the formation of a qualified personality in the target, normative, substantive, procedural, effective-evaluative components of the pedagogical system.

The laws that serve as a theoretical condition for the existence of open self-developing systems in relation to the system of methodological training of physics students in higher pedagogical educational institutions can be expressed as follows:

The integrity and unity of the structural elements of the methodological training system, aimed at the self-development of the student's personality;

The priority of relations in relation to the elements that determine the nature of the system;

The openness of the methodological training system, the ability to adapt to new goals in accordance with changing socio-cultural, scientific, pedagogical conditions;

The dialectical unity of the social conditioning of education and the freedom to choose the path of development, the implementation of the proposed initiatives;

Mutual exchange of information, initiative between the subjects of methodological training, cooperation in managing changes, dialogical interaction at various levels.

The principle of consistency requires a systematic consideration of the goals, content and process of methodological preparation in their unity, since it is known that new ideas, trends, approaches lead to systemic changes in education. The educational strategy, reflecting the topic, introduces a certain specificity into the components of the system: purposeful, substantive, procedural, and result-based assessment.

Results

As is known, methodological training is distinguished from other types of professional training by the correspondence of the content and procedural

aspects of training, therefore, students transfer the methods and technological techniques they have learned to school practice (for example, students develop problem-dialogical teaching, reflective teaching, etc. based on the implementation of tasks based on physics teaching methods developed on the basis of the same technologies).

The principle of consistency determines the formation of the content of methodological training of physics students as a system consisting of interconnected: epistemological, personal-activity, axiological components. Updating the content component of the system requires the introduction of a system of value ideas in the spiritual-moral and ecological-humanistic directions into the content of methodological subjects, and strengthening interdisciplinarity.

The process of methodological preparation of physics students determines the sequence of studying educational topics in the structure of methodological disciplines, the sequence and interrelation of lecture-theoretical and laboratory-practical exercises, independent work, pedagogical and field practice.

The logic of the practice of the educational process, determined by the subjective-reflexive educational strategy, is manifested in the fact that the forms and methods of teaching and control are aimed at establishing subjective relations between students and teachers, leading to their unity and unity.

The functioning of the procedural component of the system is determined by the following requirements:

systematic use of methods and tools that stimulate the educational-cognitive, professional-modeling, scientific-research, value-oriented, informational, communicative, creative activities of students, develop the subjective position of the individual, the ability to value-semantic exchange; dialogue; traditional and the latest textbooks and their well-founded didactic and methodological application allow physics students to directly enter the environment of professional activity aimed at implementing the goals and objectives of their education;

alternative, flexible, ergonomic use of methods and forms of organizing activities, taking into account the cognitive interests and needs of the participants in the educational process.

Due to the coincidence of the content and procedural aspects of methodological training (teaching humanitarian technologies using the same humanitarian technologies), the described system represents the meaningful integrity of all

types of actions of teachers and students related to the process of organizing the subject. or subject-object-subject interaction. The functionality of the updated system is determined by the requirement for the openness (transparency) of all its components. In such conditions, students understand the personal meaning of educational activity and, therefore, understand the content and purpose of their future profession. This factor gives the methodological education system the properties of a self-developing self-awareness system, the creator and creator of which becomes a person as a subject of professional and pedagogical activity.

The principle of stability serves as a means of maintaining the structure of methodological training of physics students, while the educational strategy reflecting the subject determines the leading role of the principles of subjectivity and reflexivity, which give this system a person-oriented character. The subjective position of the individual is a decisive factor in the educational process, and his personal development serves as one of the main educational goals. The subjective position of the student at the Pedagogical University is considered by Professor A.G. Gogoberidze as a developing quality of his personal position, which serves as a certain indicator of his personal and professional development.

The principle of subjectivity involves taking into account the personal characteristics of the subjects of the educational process, such as the orientation of the individual, his value orientations, social claims, attitudes, and dominant motives of activity and behavior. Among the many factors influencing the development of the subjective position of the student in pedagogical higher educational institutions, the student's activity in self-education (educational activity) occupies a special place. This activity becomes a factor of development in cases where it is aimed at identifying and solving the student's personal educational problems.

Subjectivity as a principle of the methodological educational process determines the need to create conditions for the formation of organizational skills in students, including knowledge of the goals and objectives of their activities, planning their activities, choosing methods and means of their implementation, and the sequence of technological processes. The influence of the principle of subjectivity begins to manifest itself in the individualization and strengthening of the personal orientation of students' education, in their desire to realize their abilities in their activities. Solving problems related to the organization of

students' independent work is determined by the need to change the ratio of traditional classes and classes conducted in interactive forms of extracurricular and extracurricular work, which is determined by modern educational standards.

Discussion

The principle of practical orientation of the educational process, which is associated with the principle of subjectivity, implies the formation of professional competencies in the process of pedagogical, research and educational practice in the methodological training of physics students, that is, conditions that are close to each other. The principle of practical orientation of the educational process is associated, first of all, with the requirement to eliminate the one-sidedness of students' mental labor, since without practical experience in organizing various forms of educational activity (lessons, extracurricular, extracurricular, preschool education, etc. homework, excursions, elective courses), students cannot establish interpersonal relationships with students, they do not have an idea of the systematic work of an educational institution.

Pedagogical and scientific-pedagogical practice is a form of work that allows you to organize educational and scientific-research activities in real time in various types of educational institutions (secondary schools, secondary vocational and additional educational institutions).

This form of work with students helps to understand a specific professional problem and develop possible options for solving it; develops the ability to clearly and reasonably express one's position and, if it is justified, to respect someone else's point of view.

Among the variety of practical tasks, special attention is paid to the formation of students' skills in organizing and conducting educational and scientific-research activities in physics. The necessary conditions for organizing the process of teaching school physics are the use of a learning and experimental platform and a corner of nature as a means of educational environment and teaching tools, as well as communication with unique natural monuments; awareness of their involvement in the national natural and cultural heritage.

Involving students in solving professional pedagogical and methodological problems in the physics teaching course allows them to expand their worldview and professional knowledge, acquire new methods of action, skills, and independently adapt the content of the educational process in specific

conditions of educational practice; which ultimately creates opportunities for a real contribution to the development of professional competencies. The principle of research-oriented methodological training continues the principle of its practical orientation, since it involves reflecting the theoretical aspects of physical, psychological, pedagogical sciences in methodological research aimed at solving students' professional problems. problems.

During this practice, students must perform various research tasks:

collect scientific, theoretical and methodological materials on the problem under study, systematize the conceptual apparatus, determine the conditions for conducting experimental work, conduct an experimental experiment;

conduct the diagnostic stage of the pedagogical experiment using pedagogical research methods: observation, interview, questionnaire, conversation, etc.;

conduct the formative stage of the experiment, the purpose of which is to search for effective methods of teaching physics within the framework of the selected topic, to search for ways to form the necessary qualities in students;

complete the experiment.

The principle of the orientation of the educational process to scientific research implies the following:

systematically systematize the disciplines of the methodological cycle, identifying the conceptual core that makes up the system;

provide students with reliable information, strengthen the theoretical and generalizing functions of the concepts, facts, laws and regularities being studied;

reflection of the problem of improving physics education in the content of the cycle of methodological disciplines in a historical and methodological sense;

ensuring the unity of scientific, educational and pedagogical activities.

The research nature of the content of methodological preparatory subjects for physics students implies:

a philosophical, methodological and ideological conceptual orientation in the study of scientific concepts, models, principles, research results of general scientific and cultural significance;

the use of materials related to epistemology and philosophy by students in the development of problems of physics teaching methodology.

The requirement for setting technological goals, planning and organizing the process of methodological preparation in the system of methodological preparation of physics students allows it to be characterized as follows:

the technological effectiveness of setting the goals of the educational process (diagnostics, repeatability, predetermined result; optimality, etc.) and designing the structure and content of educational-cognitive, educational-professional, constructive, scientific-research, communicative-dialogical and other types of activities of physics students;

technological efficiency of content construction, which consists in focusing on conceptualization, technological operations and methods of selecting and structuring the components of the content of methodological disciplines;

technological efficiency of the educational process, which clearly defines educational technologies that ensure the individualization of educational forms, the development of creativity and professional competencies, the harmonization of interpersonal interaction and communication in the process of solving educational problems; technologies that contribute to the manifestation of subjective characteristics in the worldview of a person, in his professional and social activities;

Conclusion

Their work is to determine ways to structure curricula for the cycle of methodological subjects, to structure and interconnect training courses, and to organize an educational process aimed at developing the position of science in the professional pedagogical activity of the future physics teacher.

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