CHAPTER 2
INNOVATIONS IN THE MANAGEMENT OF EDUCATIONAL INSTITUTIONS

TEACHING-PEDAGOGICAL PRACTICE IN THE SYSTEM OF PROFESSIONAL TRAINING OF FUTURE PHYSICS TEACHERS

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Abstract. *The article is devoted to the analysis of some pressing questions of organization and conducting of pedagogical practice in the system of future teacher of physics professional preparation in the aspect of forming his professional culture and competence. The reform of higher pedagogical education in Ukraine is part of the ongoing educational system updates in European countries over the last twenty years. These reforms are driven by ideas of human-centeredness and democratization, recognizing the importance of knowledge as a catalyst for societal well-being and progress, and the creation of a unified educational space. These changes pertain to new educational standards, qualification models, and methodological systems for professional training at the "bachelor" and "master" levels, which are based on activity-based, personality-oriented, and competency-based approaches. These reforms also involve the implementation of educational innovations and new information technologies in teaching and learning. Society entrusts educators with its future and naturally expects them to employ the most effective teaching methods and forms to impart the fundamentals of science. The quality of youth education, their ability to thrive and work in an information-driven society, contribute to a knowledge-based economy, and gain competitive advantages, all hinge on the level of a teacher's professional competence. In today's context of tiered and specialized differentiation, variability in physics school curricula and textbooks, and the development of new information technologies in education, this thesis assumes special significance. In the professional training of future physics teachers, a special place is reserved for pedagogical practice, the main goal of which is for them to acquire initial professional experience in independent work under conditions that closely resemble their future profession. This practice aims to develop pedagogical thinking and professionally significant personal qualities, ultimately leading to the acquisition of professional competence.*

Keywords: *pedagogical practice, information-driven society, professional culture and competence, independent work, human-centeredness and democratization.*

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Introduction. The analysis of scientific-methodical literature, specialized periodicals, and conference materials reveals a declining level of preparedness among students majoring in physics-related fields at pedagogical universities to address contemporary educational challenges in the process of teaching physics in secondary schools. Some of them encounter difficulties when independently applying their acquired knowledge to explain physical processes and phenomena, solve problems, and work with educational equipment. Many students struggle with performing methodological tasks related to calendar and thematic planning, selecting the content and scope of educational information in line with the lesson's topic, as well as choosing appropriate forms and methods for student-centered learning activities. Additionally, they face challenges in considering students' age and individual characteristics, drafting lesson plans, preparing extracurricular activities, conducting simple pedagogical experiments, and more.

This situation is not solely attributed to socio-economic factors but also to the absence of a personality-oriented approach in the preparation of future physics teachers, especially during their pedagogical practice. There exists a traditional approach that caters to the so-called average student without considering their level of preparation and individual qualities. Meanwhile, the variability and flexibility of modern educational programs and technologies impose specific requirements on the personality of the future physics teacher, including: a profound mastery of the subject and its teaching methodology, a broad scientific outlook, a high level of culture and professional competence, and the ability for lifelong self-learning and self-improvement.

Therefore, there is a gap between the demands of the job market and the level of practical preparedness of future professionals, who face difficulties adapting to the real pedagogical process in modern secondary schools. Prominent educators such as G. Vashchenko, A. Makarenko, I. Ohienko, S. Rubinshtein, V. Sukhomlynsky, and K. Ushinsky have emphasized the necessity of combining deep theoretical knowledge with purposeful practical training and systematic involvement of future teachers in real educational institutions. The theoretical and methodological foundations of teacher training have been studied by researchers like O. Abdulina, Yu. Babansky, V. Bezpalko, I. Bekh, S. Honcharenko, I. Ziazun, N. Kuzmina, V. Kremen, M. Lugovyi, N. Nichkalo, M. Skatkin, V. Shadrikov, and others. The place and role of pedagogical practice in the teacher's professional training system have been the focus of works by S. Arkhangelsky, V. Bondar, S. Polyansky, M. Prykhodko, V. Rozov, V. Slastonin, N. Talizina, and others. The introduction of school life into practice should be carried out by students through observation of the best examples. During their pre-diploma practice, students conduct demonstrations of the best lessons given by local teachers, winners of competitions like "Teacher of the Year" and "Class Leader of the Year," followed by analysis. Additionally, the planned review and discussion of fragments of artistic and documentary films on pedagogical topics, such as "Pedagogy of Compassion" and "Architecture of the Soul" (by Professor Redko H.B., Odessa), are included in the program. The pre-pedagogical practice program includes tasks for independent work, which require deep theoretical knowledge and the ability to

conduct observations, summarize and systematize collected materials, use various methods for student and class diagnostics, and apply techniques for educational impact. The use of interactive teaching methods (such as roundtables, pair work, group work, changing groups, aquarium, microphone, etc.), the review and analysis of pedagogical artistic and documentary films, lesson simulations, and more before and during the pre-pedagogical pedagogical practice stimulates and activates students' independent work.

This includes completing written creative tasks, discussions, debates, contests for the best segment of a lesson or extracurricular activity, the results of micro-studies related to the testing of non-traditional teaching methods for student and class engagement. The results of pre-pedagogical practice are discussed jointly by the methodologist and students upon completion of each stage. During the first stage of pre-pedagogical practice, students are encouraged to create and coordinate an "Individual Plan for the Development of Pedagogical Abilities" for the entire practice period with teachers and methodologists. Afterward, to enhance the effectiveness of professional competence formation, trainees conduct "modeling lessons" with their fellow students, who play the role of students. This helps students overcome their uncertainties and "polish" contentious elements of their future lessons. To develop pedagogical abilities, which are a component of the future physics teacher's professional competence, we conducted pedagogical training sessions (to develop communication, suggestive, perceptive, and other skills), pedagogical workshops, lesson simulations, encouraged students to complete individual creative tasks, and utilized other forms where tasks were presented in a problem-oriented manner during this type of practice. For the development of research competence during practical classes and student pedagogical meetings, we discussed pedagogical situations (problems) taken from pedagogical literature, personal observations, and the experiences of graduates. Many interesting tasks were drawn from lesson plans, lesson analyses, pedagogical diaries, and reports from student trainees. When selecting tasks for practical classes, we aimed to incorporate facts and situations that arose during the study of various academic disciplines. The use of such tasks promotes a more thoughtful understanding of theoretical concepts among students, acquaints them with advanced teaching methods and practices, encourages them to observe and analyze their own work and the work of others, and helps them approach the assessment of each technique and method more critically. Most importantly, it enables them to create new approaches themselves, which are crucial components for forming the professional competence of future physics teachers. The success of the professional competence formation process, as evidenced by experience, largely depends on the level of development of humane interpersonal relationships among students and between students and the teacher-supervisor during pedagogical practice.

According to the developed system, students' activities gradually become more complex from one course to another, depending on the purpose and objectives of learning at each stage of professional competence formation, the level of theoretical preparation, as well as the independence of future teachers in the process of their

activities, their overall development, and individual characteristics. The main goal of educational practice in school physics experimentation is the formation of didactic competence. Therefore, the focus is placed on developing students' abilities and skills in conducting frontal laboratory classes (frontal laboratory work, frontal experiments, experimental tasks), as well as work in the physics laboratory.

To achieve the goal of preparing future physics teachers, the following tasks need to be completed: study the topics of frontal laboratory work in accordance with the curriculum for eleven-year-olds in physics; familiarize oneself with the equipment used for conducting school-level physics experiments, which is produced by the industry; explore possible variations of instructions for conducting frontal laboratory work (descriptions in textbooks, workbooks) and anticipate the possibility of implementing them for both specialized and leveled instruction for students; study safety regulations for life activities when conducting frontal laboratory sessions and physics practical work; earn how to provide safety instructions and maintain documentation for safety measures in the physics classroom; creating new devices or modifying existing ones (with the teacher's permission) for conducting frontal laboratory sessions and physics practical work, and proposing new instructions for their use; Learning to perform basic repairs on apparatus is essential. Carrying out laboratory work, physics practical exercises, and home experimental assignments requires a specific set of skills, including the ability to plan and prepare experiments, observe, measure physical quantities, and process and interpret experimental results. Since the educational process, from a psychological and pedagogical perspective, involves the interaction of two participants (the teacher and the student), a significant role in addressing the tasks of the school physics course lies with the teacher. The teacher should be prepared for experimental activities and possess the necessary skills. The process of acquiring skills is quite complex, and it continues during the period of receiving professional education as well as in the course of practical activities. For future teachers, it is essential to provide opportunities for further improvement of their experimental skills gained while performing laboratory work from various physics courses. The main goal of the production pedagogical practice for fourth-year students is the formation of professional competence and the enhancement of didactic, communicative, and research competencies. This is achieved through the generalization, systematization, and deepening of pedagogical knowledge, skills, and abilities, as well as preparing students to perform all the functions of a physics teacher and implement a system of educational work with students. This serves as a prerequisite for: forming a cognitive interest in independent deepening of knowledge in psychological-pedagogical and professional disciplines; developing the motivational sphere of personality, values, and needs in activities that ensure logical connections with all components of the learning process; shaping systems of actions and cognitive changes in the individual's cognition, promoting cognitive activity as a whole, which will contribute to the formation of the professional competence of the future physics teacher.

The distinctive feature of the production pedagogical practice for fourth-year students is that they become involved in a team addressing real problems of the

teacher's professional work. They become acquainted with the actual content and scope of this work and independently perform all the duties of a teacher's assistant in their specialized field and class leadership. Moreover, their practice in the school environment contributes to the development of independence in defining and implementing educational tasks.

Fifth-year students, during their production pedagogical practice, work as physics teachers and class leaders. Their activities have a creative character as they independently perform the functions of a teacher and class leader, develop and implement their own activity programs, and analyze the results.

The achievement of the goal of forming professional competence in fifth-year students occurs through differentiating and individualizing the content and organizing pedagogical practice. This includes offering students a variety of tasks based on their professional orientation, general and professional training, and individual characteristics. It also involves allowing voluntary selection of the object of work and types of activities, and using a wide range of collective, group, and individual work forms.

In addition to assigning student groups to schools, it is also beneficial to individually attach some students to experienced educators to learn from the best examples of pedagogical experience. Throughout this type of pedagogical practice, methods similar to those used during the preparatory and production pedagogical practice of the educational qualification level "bachelor" are employed, taking into account changes that have occurred in previous types of practice. For example, for the development of research competence, pedagogical tasks from innovative educators' experiences are selected, and for the development of communicative competence, students are encouraged to communicate with parents to achieve mutual understanding and active cooperation.

The study of this integral component of the professional training of future physics teachers has been explored by scholars such as O. Bugayov, S. Kamenetsky, N. Purysheva, O. Pyorishkin, I. Sokolov, A. Usova, and others.

Literature review. Recognizing what has been accomplished, it is worth noting that under modern conditions of higher pedagogical education reform in the context of European requirements, shifting the focus from the process of learning to its outcomes, and implementing personality-oriented and competency-based approaches, the issue of improving the effectiveness of organizing and conducting pedagogical practice as an integral component of practical training for future professional pedagogues remains relevant. In this regard, the purpose of this article is to analyze some current issues related to the organization and conduct of pedagogical practice in the system of professional training for future physics teachers, with a focus on shaping their professional culture and competence.

Preparing a highly qualified and competent teacher is a complex and multifaceted process, largely determined by the experience and the feelings they acquire in the early days of their pedagogical career, especially during their period of pedagogical practice. The successful organization and management of this practice is significantly influenced by the style of thinking and the level of professional culture

of the future expert. The formation of these aspects within the individual's overall personality structure is one of the most important educational tasks of a pedagogical university, a vital factor in its cognitive and exploratory activities. However, equipping students with a system of scientific knowledge during the study of disciplines in the fields of psychology, pedagogy, natural sciences, and the professional cycle of training does not automatically ensure the development of their pedagogical thinking and professional culture. The cultivation of these attributes is a lengthy process that requires knowledge and effort, representing a level of thinking culture that they can only achieve through purposeful, specially organized work.

Due to this, a special place in the system of professional training for future physics teachers is occupied by the course of physics teaching methods, where students master both general and specific issues of the discipline and the system of school physics experiments. The students' attention is focused on comprehending and understanding the fundamentals of pedagogical activities related to the analysis of traditional course questions, including what, why, and how to teach, as well as planning and organizing the educational process, searching for ways to enhance its effectiveness and efficiency. However, the reduction in classroom hours and the shift towards self-study, which has been happening recently, pose certain challenges to the quality assimilation of the fundamental course topics, which undoubtedly affects the effectiveness of pedagogical practice.

In our opinion, the foundation for addressing these issues in the training of modern physics teachers is the concept of fundamentalization as a new philosophy of education quality. This approach involves the in-depth mastery of universal, methodological, and subject-specific knowledge, overcoming professional isolation and cultural limitations, and reorienting education towards the development of a harmoniously developed individual. This can only be achieved through the integration of fundamental and professional training for future physics teachers and by providing a creative, research-oriented nature to their educational and cognitive activities. This is particularly relevant during the period of pedagogical practice.

The teacher's role should be to stimulate students, help them define their own learning trajectory since personal knowledge is truly fundamental. Under such conditions, education will be the most promising investment in the future specialist. The organizational and methodological basis for managing the process of pedagogical practice for future physics teachers is a system where the objectives and tasks, content, and structure, as well as the responsibilities of supervisors and students, are clearly interrelated. Uniform goals and requirements, standardization of pedagogical university regulatory documents, the organization and conduct of practice based on individual educational programs that include a creative, research component, and the introduction of a rating system for evaluating students' activities collectively contribute to raising the level and quality of their professional training, consequently enhancing their successful adaptation to the real pedagogical processes in modern comprehensive schools.

Aims. The purpose of the article is to highlight the features of educational and pedagogical practice in the system of professional training of future teachers of physics.

Methodology. The analysis of state normative documents, educational and methodological materials, periodicals, and dissertations related to the organization and conduct of pedagogical practice in the system of professional training for future physics teachers has allowed us to prepare a working program and methodological recommendations that can serve as a well-directed basis for actions. Thus, pedagogical practice is an integral component of the professional training of future physics teachers, performing several important functions:

1. Adaptation function: It familiarizes students with the specifics of organizing the educational process in real conditions of a general educational institution, the rhythm of the pedagogical process, the system of internal relationships and connections.

2. Educational function: It consolidates, expands, and deepens the knowledge, skills, and abilities acquired during the study of disciplines in the fields of psychology and pedagogy, natural sciences, professional preparation, and practical training. It also involves acquiring contemporary teaching technologies and physics teaching methods.

3. Developmental function: It fosters the development of pedagogical thinking and professional culture, worldview, cognitive activity, independence, and the formation of research skills, including self-education.

4. Educational function: It promotes the formation of an active life position, responsibility, the development of professionally significant personal qualities, as well as interest and love for the teaching profession.

5. Organizational function: It involves organizing one's own pedagogical activities and students' learning activities, applying elements of interaction and cooperation, and creating a student community.

6. Projective function: It includes planning one's own educational and educational work, selecting the content and scope of educational information according to the lesson's topic, optimally combining forms and methods of educational and cognitive work with students, taking into account their age and individual characteristics, and preparing lesson plans, educational activities, and more.

7. Communicative function: It entails establishing pedagogical communication with students, parents, and colleagues based on mutual understanding, mutual respect, empathy, and partnership, as well as creating a friendly psychological atmosphere aimed at acquiring new educational information.

8. Diagnostic function: It involves assessing the level and quality of professional and general education, the ability to self-control, self-analysis, and self-evaluation of one's pedagogical activities.

Results. Pedagogical practice involves students working independently with scientific and methodological literature, systematically observing and analyzing the educational process, studying the experience of physics teachers, familiarizing

themselves with the system and methods of using demonstration and laboratory equipment, technical means of teaching (TMT), planning their own educational work, conducting and analyzing open educational sessions, and organizing educational events. This period of the educational process should be seen as an opportunity for students to improve their skills in scientific research on relevant pedagogical, psychological, physics teaching methodology issues, as well as prepare necessary materials for their qualification (diploma) work. The overall supervision and implementation of the practice program are carried out by the person appointed by the pedagogical university's practice department. Direct guidance during the practice is provided by experienced teacher-methodologists who are assigned by the department based on their scientific interests, pedagogical workload, and at least 5 years of work experience in the field of preparing specialists in the relevant direction. Pedagogical practice begins with an introductory conference attended by the supervisor, teacher-methodologists, and students. During this conference, the following issues are discussed: the goals and objectives of the practice, its duration, types and forms of pedagogical activities for students, the rights and responsibilities of interns, teacher-methodologists, the allocation of students to schools, and the monitoring procedure for their work. Requirements for the documentation of the practice are also discussed. During the practice, students take on the role of a teacher, so they are required to adhere to the schedule of the educational institution, undergo training on occupational safety and fire safety rules, and work according to an individually developed plan that has been approved by the teacher-methodologist (practice supervisor). The content of the practice should have an individual creative character and include the following types of activities.

Discussion. Educational and Methodical Work:

a) Familiarization with the specifics of organizing the educational process in a general education institution, the rhythm of the pedagogical process; the annual plan of educational and extracurricular activities of the school, the work of the pedagogical council, methodological associations, and the parent committee.

b) Study of the curriculum for the educational course; the calendar, thematic, and lesson plans for the work of the physics teacher; analysis of students' performance based on class records, students' notebooks, and diaries.

c) Getting acquainted with the physics classroom and its material and technical equipment.

d) Attending physics teacher's classes, familiarization with their teaching methods and forms of work (including the use of active teaching methods, problem situations, non-traditional forms of organizing students' cognitive activities, methods of knowledge assessment, etc.).

e) Systematic individual work with individual students; counseling students engaged in scientific research in the Ukrainian Student Research Association (MAH).

f) Selection and creation of didactic materials and visual aids (wall charts, displays, classroom decoration).

g) Independent planning and conducting of lessons of various types using modern teaching methods and ICT, their obligatory discussion and self-analysis.

h) Attending and analyzing the lessons of fellow teacher-practitioners.

i) Participation in the work of teachers' methodological associations, preparation of presentations and reports.

2. Educational and Upbringing Work:

a) Attending and analyzing the class teacher's upbringing events; studying and summarizing their experience in upbringing work.

b) Pedagogical observations of students and the class, studying their age and individual characteristics, analyzing academic performance and behavior problems.

c) Independent preparation and conduct of upbringing events.

d) Conversations with students and colleagues, preparing psychological and pedagogical characteristics of individual students and the class as a whole.

e) Individual conversations with parents, consultations.

During the pedagogical practice, students should demonstrate knowledge of educational disciplines from the psychological-pedagogical, natural-scientific, and professional cycles of training and develop the following skills based on them: organizational, professional, communicative, projective, and reflective-creative. Upon completion of the practice, students acquire the following skills:

1) Planning, organizing, and conducting various types of lessons and upbringing events.

2) Organizing communication with students and colleagues during the process of joint interaction.

3) Perception, understanding, control, and correction of students' behavior.

4) Analysis and ways to resolve specific pedagogical situations.

5) Formation of elements of their own pedagogical style.

To improve the quality of practical training for future physics teachers during their pedagogical practice, it is possible to provide them with individual tasks that will help them acquire experience in solving pedagogical, scientific, and organizational tasks, including those related to psychological-pedagogical diagnostics of the educational process. Performing such tasks will activate students' activities, expand their horizons, increase initiative, and make the practice more specific and purposeful.

Individual tasks can include the following directions:

Didactic tasks:

a) Preparation of didactic materials, visual aids, demonstration and laboratory equipment, and ICT for specific topics/sections of the physics course, taking into account various forms and methods of organizing students' cognitive activities, including ICT tools.

b) Development of assessment tasks to check the level of students' initial knowledge of specific topics/sections of the course.

Scientific-methodical tasks:

a) Analysis and summarization of the pedagogical experience of the physics teacher.

b) Study and summarization of the state of the material and technical equipment of the physics classroom.

c) Analysis of the influence of teaching methods and approaches on the quality of students' assimilation of the educational material.

d) Participation in the work of teachers' methodological associations, preparation of presentations and reports.

Upbringing tasks:

a) Assistance to the class teacher in conducting upbringing events.

b) Organization and conduct of their own upbringing event.

c) Development of visual propaganda materials (posters, wall charts, announcements, etc.) with a professional focus.

Psychological-pedagogical diagnostics tasks of the educational process:

a) Study of the features of students' cognitive activities (learning interests, motivation, attitude towards independent work, etc.), and identification of factors affecting positive motivation for learning.

b) Study of students' personal development (values, motives), analysis of socially inadequate behavior.

c) Study of interpersonal relationships among students in the group, analysis of specific pedagogical conflicts and ways to resolve them.

The content of individual tasks during the practice may be specified and refined by the physics teacher. Materials obtained by the student during the execution of individual tasks can be used in the future for the preparation of qualification work, presentations, articles, and more. Systematic analysis of educational and methodical work, upbringing work, and individual tasks of the student requires mandatory documentation in a journal of psychological and pedagogical observations.

Conclusions. The preparation of highly qualified specialists has been and remains the most important task of domestic higher pedagogical education. Modern society has a fundamental educational need for the formation of individuals capable of self-learning, self-education, and self-improvement throughout their lives; individuals who can easily adapt to rapidly changing socio-economic and information-technological conditions, have a broad scientific worldview, a high level of culture, and professional competence. However, it should be noted that the existing system of practical training for future physics teachers does not fully ensure their competitiveness, mobility, and ability to adapt socially and professionally. An explanation for this lies in the gap between the demands of the labor market and the quality of practical training for future professionals, a crucial component of which is pedagogical practice.

In our view, the main theoretical and methodological principles for organizing and conducting pedagogical practice, which will contribute to the self-realization of future physics teachers in the process of their professional development and, consequently, successful adaptation to the real pedagogical process in modern educational institutions, should include:

1. Strengthening the interconnection between the higher education institution (HEI) and the general educational institution (school).

2. Integration of fundamental and professional training based on a person-oriented, competency-based, and credit-based approach.

3. Increased emphasis on methodological preparation for future physics teachers.

4. Providing practice with a research-oriented character by introducing individual educational programs that involve creative and research tasks.

5. Implementation of a rating system for assessing students' performance.

We have analyzed the foundational concepts of the competency-based approach, defined and developed the concepts of "competence" and "professional competence," and clarified the essence of the process of forming professional competence.

Based on the analysis of the scientific literature, we find it appropriate to distinguish between the concepts of "competence" and "competency." Competency reflects the functional capabilities of a specialist and derives from the Latin word "competentia," meaning suitability for a task, a sphere of responsibilities entrusted to a specific individual. In contrast, the concept of "competence" is broader in meaning and closer to the concept of "professionalism." By professional competence of future physics teachers, we understand the totality of personal and professional qualities of a student (value content orientations, knowledge, skills, abilities) resulting from their experience in a specific socially and personally significant sphere of activity.

Competence is the student's mastery of a specific competency (or competencies), which includes their personal attitude toward it and the subject of their activity. It has been clarified that the peculiarity of the process of forming the professional competence of future physics teachers lies in the complex dialectical relationship between the researched concept and pedagogical practice as a means of its formation. On one hand, during pedagogical practice, the student will be involved in real pedagogical processes and interaction with children, so they should already have a sufficient level of professional competence. On the other hand, pedagogical practice, in our opinion, can most effectively contribute to its formation.

Nowadays, there is a need to justify the use of special pedagogical conditions because students lack the necessary skills, abilities, and psychological readiness to work in educational institutions of various types. Students need to familiarize themselves with the structure and content of the educational process in educational institutions, as well as the specific work of physics teachers and class leaders. The importance and necessity of using special pedagogical conditions for the formation of professional competence in future physics teachers during pedagogical practice have been substantiated. It has been proven that the use of such conditions stimulates independent thinking among students, promotes active learning, positively influences cognitive motivation, develops self-control skills, and gives the educational-cognitive activities of students a research-oriented direction.It has been established that in modern conditions, the theoretical foundation for the renewal of the content of professional education, aligning it with contemporary needs in accordance with European and global educational trends, relies on the competency-based approach and the creation of effective mechanisms for its implementation. This approach is widely recognized in global pedagogical thought and actively implemented in domestic professional education practice. It entails a shift from the traditional knowledge-centered paradigm to the formation of a clearly defined set of

competencies that embody the readiness of future professionals to perform their professional activities.

Therefore, the key pedagogical conditions for the effective organization of pedagogical practice in the preparation of future physics teachers include:

1. Mastery of modern methods and forms of pedagogical activities, effective teaching technologies.

2. Acquisition of pedagogical forms of educational interaction with students and the ability to independently and creatively apply knowledge and methods acquired during the study of specialized and psycho-pedagogical disciplines.

3. Development of a creative and research-oriented approach to pedagogical activities.

4. Gaining experience in conducting scientific-methodical work and research-experimental forms of pedagogical activities.

5. Familiarization with the experience of teachers and the mastery of the most effective teaching techniques and methods used by them.

Additionally, specific (not typical for traditional) forms of organizing students' educational activities aimed at shaping their professional competence during pedagogical practice have been experimentally verified. These include seminars held before each type of practice, which help students activate their previous knowledge of pedagogy, psychology, and physics teaching methodology, as well as mini-pedagogical student councils, which involve the presence of both a teacher and a lecturer, among other things.

It has been demonstrated that the effectiveness of educational activities, the level of motivational, cognitive, and operational components of professional competence in students from the experimental group after the formative stage of the pedagogical experiment is significantly higher.

A comprehensive program of pedagogical practice for students of physical specialties, aimed at shaping their professional competence, has been developed and implemented in the educational process of higher pedagogical institutions in Ukraine. The educational manual "Practical Professional Pedagogical Training for Students of Physical Specialties" has been created, which contains specific, non-traditional forms, methods, and techniques for organizing pedagogical practice. This manual serves as the methodological basis for organizing pedagogical practice and reveals the pedagogical conditions for the formation of professional competence of future physics teachers.

Future research prospects in this direction include the creation of a comprehensive model for organizing and managing the pedagogical practice of future physics teachers, the determination of organizational and pedagogical conditions and criteria for assessing all its components based on a rating system in the context of European requirements.

References:

1. Kacova, L. I. Formation of Professional Interest in Future Physics Teachers during Pedagogical Practice: Author's Abstract of the Dissertation for the Degree of Candidate of Pedagogical Sciences: 13.00.04 – Theory and Methodology of Professional Education. Kharkiv: V. N. Karazin Kharkiv National University, 2005. 20 p.

2. Konovalova, I. P. Development of Professional Creative Activity in Students - Future Physics Teachers during Pedagogical Practice: Author's Abstract of the Dissertation for the Degree of Candidate of Pedagogical Sciences: 13.00.02 – Theory and Methods of Physics Education, MPGU, 1998. 18 p.
3. Fundamental Principles of Higher Education Development in Ukraine in the Context of the Bologna Process / [Stepko M.F., Boliubash Ya.Ya., Shynkaruk V.D., Hrubinko V.V., Babin I.I.]; edited by V. G. Kremen. Kyiv, 2004. 146 p.
4. Regulations on the Conduct of Student Practice in Higher Educational Institutions of Ukraine: Approved by the Resolution of the Cabinet of Ministers of Ukraine No. 93 dated 08.04.93. *Collection of Legislative and Regulatory Acts on Education*. Kyiv, 1994. Issue 1. pp. 139 – 193.
5. Shkola, O. V. Practice in Higher Educational Institutions: Work Program and Methodological Recommendations for Physics Masters: Educational Manual. Donetsk: "Yugo-Vostok," 2011. 56 p.
6. Tsokolenko, O. A. Formation of the Ability to Analyze Conduct of Educational Activities during Practice by Master's Degree Students at a Pedagogical University. Scientific Notes: [Collection of Scientific Articles]. Series: Pedagogical and Historical Sciences. Issue SX(110). Kyiv: Publishing House of M.P. Dragomanov National Pedagogical University, 2013. pp. 205-211.
7. Tsokolenko, O. A. Improvement of Experimental Skills of Future Physics Teachers during Practice in School Physics Experimentation. Scientific Notes. Issue 4. Series: Problems of Physics, Mathematics, and Technological Education. Part 2. Kirovograd: RVV KSPU named after V. Vynnychenko, 2013. pp. 230-236.
8. Tsokolenko, O. A. The Role of Pedagogical Practice in Preparing Future Teachers for Professional Activity. *Scientific Journal of the National Pedagogical University named after M.P. Dragomanov*. Series 5. Pedagogical Sciences: Realities and Prospects. Issue 40: Collection of Scientific Papers / edited by Prof. V.D. Syrotyuk. Kyiv: Publishing House of M.P. Dragomanov National Pedagogical University, 2013. pp. 255-259.