

ANNOTATION

On the dissertation for scientific degree of Doctor Philosophy (PhD) in specialty 6D011000 - Physics Shektibaev Nurdaulet Atenovich

Research topic: «Methods of development of subject competence of future physics teachers in teaching the elective course «Physics of the nucleus and elementary particles»»

Learning purpose: is to develop a methodology for the development of subject competence in the study of the elective course «physics of the nucleus and elementary particles» for future physics teachers and to test its effectiveness in the course of practical work.

Research goals:

- scientific and methodological substantiation of the content of the subject competence of future physics teachers;
- determination of psychological and pedagogical features of the development of subject competence of future physics teachers;
- determination of ways to develop the subject competence of future physics teachers in the process of teaching the elective course «physics of the nucleus and elementary particles»
- the study of the elective course «physics of the nucleus and elementary particles» and the development of methods for organizing laboratory and practical work on this course, experimental verification and proof of its effectiveness.

Research methods:

- theoretical: analysis, generalization, comparison, concretization of domestic and foreign scientific-theoretical, educational-methodical, philosophical, social, psychological, pedagogical and methodological literature, previously performed dissertation research on the topic of research, design of results;
- empirical: observation, exchange of opinions with students and teachers; questionnaires; analysis of normative and educational documents, conducting tests, experimental work and statistical methods.

The main provisions submitted for protection

- the subject competence of future physics teachers is a component of professional competence as knowledge in this subject area, skills of practical implementation of the acquired knowledge (academic and methodological), the ability to implement within the framework of emotional and value relations;
- psychological (assimilation of knowledge; formation/ mastery of practical skills, actions; qualitative qualities of motivation, interest, needs, evaluation of one's own activity) and pedagogical (content of training and methods of its implementation, organizational forms, types of educational work, teaching tools) features of the development of subject competence of future physics teachers are

determined from the standpoint of the components of learning systems in achieving new results;

- the didactic condition, defined in terms of content and process, intensive and extensive ways of developing the subject competence of future physics teachers in the process of teaching an elective course, identification (alignment, identification) of nucleus and elementary particles – the didactic method), is provided by improving the purposeful-motivational, content, activity and control-evaluation components of the specialist training model;

- the methodology of developing the subject competence of a physics teacher when studying the course «physics of the nucleus and elementary particles» is implemented by the technology of intensification of learning and formation of cognitive activity based on schematic and iconic models of educational material.

The main research findings:

- the theoretical foundations of the development of the subject competence of future physics teachers are determined;

- the psychological and pedagogical features of the development of the subject competence of future physics teachers are determined;

- the approaches-didactic conditions for the development of the subject competence of a future physics teacher based on the need for emotional and value relations in the learning process are determined;

- an experimental pedagogical test of the methodology of teaching an elective course based on the professional training of future physics teachers was carried out and methodological recommendations were developed.

The novelty and significance of the results

The validity of the first scientific result is due to a deep analysis of the concepts of «competence», «competence» and their pedagogical significance in the research conducted on them, scientific papers, the definition of the main components of competence: knowledge, psychomotor skills (business) and emotional-value relations, the definition of the conceptual and categorical apparatus, «Subject competence of future physics teachers» - this is the ability to carry out the acquired scientific knowledge and skills on the subject, subject area and methodological actions for its teaching by emotional-value relations in the pedagogical process».

The validity of the second scientific result presupposes the implementation by the doctoral student of the psychological realization of the development of the subject competence of future physics teachers from the standpoint of the theory of activity and the theory (concept) of the gradual formation of mental activity for the formation and improvement of knowledge, skills and qualitative qualities of personality; from a pedagogical point of view through the pedagogical system and components of the process.

The validity of the third scientific result indicates that, as a proposed result, the development of the subject competence of future physics teachers is determined through the substantive and procedural aspects of teaching elective courses, intensive and extensive approaches to teaching pedagogical system-forming and is provided by

defining them as didactic conditions for development, improving the purposeful-motivational, content, activity and control-evaluation components of the specialist training model;

The validity of the fourth scientific result is due to the development of the elective course program «physics of the nucleus and elementary particles», aimed at developing the subject competence of the future physics teacher and electronic textbooks «physical phenomena», «physics of the atomic nucleus and elementary particles», «physics of the atomic nucleus», teaching aids «atomic and nuclear physics (laboratory work)», «basic characteristics of the course of physics of the nucleus and elementary particles».

Compliance with the directions of science development or state programs: the Law of the Republic of Kazakhstan "On Education", "Digital Kazakhstan", state programs for the development of education and science of the Republic of Kazakhstan for different periods and annual Messages of the First President of the Republic of Kazakhstan N.A.Nazarbayev and the head of state Kassym - Jomart Tokayev to the people of Kazakhstan are being implemented, which fully allows us to realize our subjective ideas in education. These paths are considered as guidelines that contribute to the sustainable development of teacher training at the university

Doctoral student's contribution to the preparation of each publication: According to the content of the research work, 34 scientific papers have been published. Of these, 4 are in the publication included in the Scopus database:

1) Didactic Conditions of Implementation of ICT in the Formation of Creativity of Future Teachers of Physics // Canadian Center of Science and Education, Asian Social Science.- 2015. - V. 11. – Iss. 28. - P.51-57. – ISSN: 1911-2017;

2) Formation of the Creativity of Students in the Context of the Education Informatization // International Journal of Environmental and Science Education. - 2016. - VOL. 11. Iss. 16. – P. 9598-9613. – ISSN: 1306-3065;

3) A model of the future teachers' professional competence formation in the process of physics teaching // Man In India. – 2017. – V. 97. – Iss. 11. – P. 517-529. – ISSN: 2068-696X;

4) Change of 0.34Cr-1Ni-Mo-Fe Steel Dislocation Structure in Plasma Electrolyte Hardening // Materials. – 2021. – V. 14/8;

9 articles have been published in publications recommended by the Committee for Quality Assurance in Education and Science:

1) Improving the professional training of future teachers // Bulletin of the Academy of Pedagogical Sciences of Kazakhstan. - Almaty, 2015. -№3 (65) - p.26-32;

2) The use of information technology is the key to the development of students' learning based on the formation of their creativity // Bulletin of the Academy of Pedagogical Sciences of Kazakhstan. - Almaty, 2016. -№6 (74) - p.71-77;

3) Efficiency of using electronic resources in teaching nuclear physics // Bulletin of the Kazakh National Pedagogical University named after Abai series «pedagogical sciences», - Almaty, 2016.- №4 (52), p.119-123;

4) General characteristics of the teaching methodology of the quantum physics section at school // Bulletin of KazNU named after Al-Farabi series «pedagogical sciences», - Almaty, 2017.- №1 (50). – p.110-117;

5) Formation of subject-methodical competence through active forms and methods of teaching // Science and Life of Kazakhstan is an international popular science magazine., - Astana, 2017., №3 (46) p. 63-66;

6) Consideration of subject-methodical competence as the main professional competence of future physics teachers // Bulletin of the WKSU named after M. Utemisov, Oral., 2018., №1 (69) p.87-92;

7) The concept of "competence" - in the pedagogical science of Kazakhstan // Science and Life of Kazakhstan is an international popular science magazine., - Astana, 2019., №5/2, p. 309-313;

8) The possibilities of developing the subject competence of future physics teachers in the elective course «physics of the nucleus and elementary particles» // Science and Life of Kazakhstan is an international popular science magazine., - Astana, 2020., №5/5, p. 269-277;

9) The progress of the training of future physics teachers in the distance learning system // Science and Life of Kazakhstan is an international popular science magazine., - Astana, 2020., №12/7, Б. 269-277;

2 articles have been published in publications of international conferences of the near and far abroad, 8 articles in publications of domestic international conferences, 3 articles in messengers of the National Academy of Sciences of the Republic of Kazakhstan, 3 electronic textbooks (patent), 1 laboratory methodological manual, 1 textbook.

These publications, depending on the content of the dissertation, are works performed by the doctoral student mainly individually (and in the author's association) in accordance with the results obtained.