

ANNOTATION

**of the dissertation for the degree of Doctor of Philosophy (PhD)
in the specialty 6D011000-Physics
of Iskakova Anargul Batyrbayevna**

Research topic: Methods of Teaching a Course of Physics for Technical Specialties in Higher Education Institutions.

The purpose of the study: development and theoretical substantiation of the methodology for teaching the course of physics in the technical specialties of a higher educational institution.

Research objectives:

- to identify the current state of teaching the course of physics in technical specialties;
- to determine the structure and content features of the course of physics in technical specialties and to study the problems of methods of teaching physics;
- to develop a methodology for the implementation of innovative technologies in the process of teaching the course of physics in technical specialties and test the developed methodology in practice.

Research methods:

- study and analysis of the regulation documents of the Ministry of Education and Science of the Republic of Kazakhstan in the field of modernization of the Kazakhstani education system, in order to identify new methods and techniques of teaching and analysis of scientific literature on the research topic;
- analysis and systematization of scientific and methodological literature and research, the content of educational programs of technical specialties of higher education institutions;
- methods of mathematical statistics for quantitative evaluation of the results of a pedagogical experiment.

The main provisions for defense:

1. Continuity of the structure and content of the physics course for technical specialties with the content of fundamental and profile disciplines in the “ High School – University” system;
2. Techniques for the organization of educational activities aimed at the formation of subject knowledge, skills and abilities of students of technical specialties.
3. A methodology for the implementation of project and transdisciplinary technologies in teaching physics in technical specialties, which contributes to improving the professional preparedness of students of technical specialties.

The main results of the research:

1. The structure and content features of the course of physics in technical specialties, the continuity of the course of physics of secondary and higher education are determined;

2. Methods for organizing the educational activities of students, forms of conducting non-traditional lectures, independent work and tests to test students' knowledge are determined;

3. A methodological system for teaching physics in technical specialties has been developed, that is, a methodology has been developed for implementing the learning goal, the content of education, and project and transdisciplinary technologies in the educational process.

Justification of the novelty and significance of the results obtained:

The validity of the first scientific result is proved by determining the structure and content features of the course of physics in technical specialties, the continuity of the course of physics of secondary and higher education by analyzing and systematizing the scientific and methodological literature and regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan on the topic of dissertation research.

The validity of the second result is determined by the development of didactic content for the courses Physics 1 and Physics 2 of the specialty 6B07104 - Instrumentation. The didactic content is equipped with author's video lectures, practical and test tasks and tasks for SIW. To implement the continuity of subject knowledge of the Physics 2 course and the profile discipline of the educational program of the specialty 6B07104-Instrument Engineering, a textbook “Fundamentals of Information and Measurement Technologies” was developed. The principle of continuity was implemented as a didactic factor in the design of a methodological system for a professionally oriented study of a physics course in technical specialties.

The validity of the third scientific result is confirmed by the development and approbation of design and transdisciplinary technologies in teaching the course of physics in technical specialties. The developed methodological system is defined as a practical basis, which helps to increase the motivation of students to master physics and specialized disciplines, increase the level of knowledge.

Compliance of Science with directions of development or state programs:

The main idea of the research meets the requirements aimed at solving the priorities and tasks specified in the Law of the Republic of Kazakhstan “On Education”, the strategic development plan of the Republic of Kazakhstan until 2025, the State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020-2025, the national project “Quality Education “Educated Nation”, the State Compulsory Standard of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan and other state regulatory and legal documents regarding the development of the Kazakhstani education system and improving the quality of training of competitive specialists.

Contribution of the doctoral student to the preparation of each publication (Percentage of the dissertation author, measured as a percentage of the total number of publication):

1. Development of innovation processes in higher education institutions in the context of international economic integration: Factors and trends // Science for

Education Today. - 2019. - № 3. - C. 200-221 (co-authored by Nurumzhanova K.A., Senkina G. Y., Kozybai A. K., Jarassova G. S., Kairbayeva A.K., 75 %).

2. Methodical foundations of the use of project-based technologies in teaching physics to students of technical specialties of higher education institutions // Bulletin of the Karaganda University Physics Series. - 2019. – No. 3. - P. 71-77 (co-authored by Kairbayeva A.K., 95 %).

3. Technology of project-based training on the example of teaching students to modeling the physical processes // Bulletin of the WKSU. - 2019. - № 4(76). - P. 229-238 (100%).

4. The formation of entrepreneurial skills of technical majors at teaching physics // Bulletin of Kazakh national women's teacher training university. - 2020. – No. 4(84). - P. 8-15 (co-authored by Nurumzhanova K.A., Jarassova G. S., 85 %).

5. The principle of continuity as a factor in the design of a methodological system for teaching physics to students of technical specialties of universities // Bulletin of Toraighyrov University. - 2021. - No. 3. - P. 15-32. (co-authored by Kairbayeva A.K., 95 %).

6. The use of innovative technologies for the preparation of students of technical specialties // Teacher's professionalism: essence, content, development prospects. International scientific and practical conference. - Moscow: MANPO, 2018. - P. 47-51 (co-authored by Kozybai A. K., 80 %).

7. Organization of independent work of students in the study of physics and mathematics // Europe and modern Russia. Integrative function of pedagogical science in a single educational space. XIV international scientific conference. - Moscow-Paris: MANPO, 2018. - P. 373-381 (co-authored by Kozybai A. K., Kutkeldieva E.O., 70 %).

8. Problems and prospects of teaching physics in technical specialties // XVIII Satpayev Readings. International scientific conference for young researchers, undergraduates and graduate students and schoolchildren. - Pavlodar: Kereku, 2018. - P. 217-224 (100 %).

9. Features of modeling the time and frequency characteristics of an oscillatory circuit in the Electronics Workbench system // XIX Satpayev Readings. International scientific conference for young researchers, undergraduate and postgraduate students and schoolchildren - Pavlodar: Kereku, 2019. - P. 195-202 (co-authored by Tursyn D. S., 95 %).

10. Prospects for the development of educational innovative technologies in Kazakhstan // Sadykov Readings – Vth International scientific and practical conference. - Almaty: Ulagat, 2018. - P. 75-78 (co-authored by Kozybai A. K., Kutkeldieva E.O., 85 %).

11. Physical models in economics. - Pavlodar: Toraighyrov University, 2019. - 73 pp. (100 %)

12. Basics of information and measurement technology. - Pavlodar: Toraighyrov University, 2019. - 123 pp. (co-authored by Ispulov N. A., Dosanov T. S., 90 %).

13. Optics. - Pavlodar: Kereku, 2017. - 72 pp. (co-authored by Isimova B.Sh., 70 %);

14. Optics. - № 0616. 03.03.2018. (co-authored by Isimova B.Sh., 70 %).

15. Basics of information and measurement technology. - № 8918. 18.03.2020. (co-authored by Dautova A.Z., Ispulov N. A., Dosanov T. S., 90%).

16. The multimedia educational program «Physics. Grade 11. 2 quarter» (natural and mathematical direction).- № 11133. 25.06.2020. (co-authored by Tazhigulova A.I., Nurgalieva G.K., Kozybai A.K., Pentina L.V., Tazhigulova A.G., Askarbek A.N., 70 %).

17. The multimedia educational program “Physics. Grade 11. 2 quarter” (natural and mathematical direction). - № 10736. 11.06.2020. (co-authored by Tazhigulova A.I., Nurgalieva G.K., Kozybai A.K., Kokebaeva A.K., Pentina L.V., Tazhigulova A.G., Askarbek A.N., 70 %).