

ABSTRACT

of the dissertation for the degree of Doctor of Philosophy (PhD) in the specialty 8D01550- "Biology"

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Research theme: "Using the results of research on regional bioresources of the Irtysh River in the training of future biology teachers"

The purpose of the research: to scientifically substantiate and experimentally verify the improvement of the quality of training of future biology teachers by using the results of research on regional bioresources of the Irtysh River.

The objectives of research:

1. To reveal the essence of the training of future biology teachers in the context of continuous environmental education.
2. Identify the problems of training future biology teachers and develop a training aid «Workshop on regional hydrobionts».
3. To test and determine the effectiveness of the content and methodology of the workshop in experimental conditions in the process of training future biology teachers.
4. To introduce the training aid «Workshop on regional hydrobionts» into the educational process of the university within the framework of the disciplines of the profiling cycle.

Research methods:

- *theoretical:* analysis of philosophical, sociological, psychological, pedagogical and educational-methodical sources, dissertation research on the problem, comparative analysis of models of environmental education and advanced pedagogical experience, generalization of theoretical positions and empirical experience);

- *experimental:* questionnaire, survey, pedagogical observation, diagnosis, testing, ascertaining, forming and control stages of the experiment;

- *statistical:* expert assessment and processing of research results using methods of mathematical statistics.

The main provisions (proven scientific hypotheses and other conclusions that are new knowledge) submitted for defense:

1. The essence is revealed and the theoretical basis for the application of the regional component in the training of future biology teachers is determined, based on the integration of regional features of biological diversity and environmental education, which contributes to the development of professional and actual competencies of students.

2. The problems of training future biology teachers related to insufficient educational and methodological material and the lack of specialized techniques have been identified. As a result, a training aid «Workshop on regional hydrobionts» was developed, aimed at deepening students' knowledge of local biota and improving their methodological training.

3. The content and methodology of the developed training aid have been tested in experimental conditions. Its effectiveness in improving the level of environmental

culture, professional competencies and actual skills of future biology teachers has been confirmed.

4. The training aid «Workshop on regional hydrobionts» has been introduced into the educational process of the university within the framework of biological cycle disciplines. This contributed to the integration of the regional component into the educational program, enriching the content of education and improving the quality of training of teaching staff to work in a multicultural and actual society.

Description of the main results of the study:

The first task provided for the disclosure of the essence and definition of the theoretical basis for the application of the regional component in the training of future biology teachers in the context of the continuous environmental content of education, which, in turn, consists in integrating environmental knowledge and principles of sustainable development into the learning process conducted in several languages. This training is aimed at developing future teachers' competencies that will allow them to effectively teach environmental aspects of biology, taking into account the cultural and linguistic characteristics of students.

The second task was aimed at identifying the problems of training future biology teachers and substantiating the methodology for improving their professional competencies by integrating a regional component, as well as developing a training aid «Workshop on regional hydrobionts». The application of the regional component in biology lessons faces a number of difficulties, including a lack of teaching aids and ready-made educational programs. However, despite these problems, scientists unanimously argue that the use of regional materials has significant educational potential. «Workshop on regional hydrobionts» provides an opportunity for students to learn how to work with real objects of nature, which makes the learning process more practical and interesting.

The third task was to test and determine the effectiveness of the content and methodology of the training aid in experimental conditions in the process of training future biology teachers. The research and implementation of the regional component in the teaching of biological disciplines not only expands students' knowledge of the local flora and fauna, but also contributes to the formation of future teachers' skills that they can apply in school practice. This is becoming an important element of teacher training aimed at developing students' environmental awareness and understanding of the uniqueness of their native region.

The fourth task was to introduce the training aid «Workshop on regional hydrobionts» into the educational process of the university within the framework of the disciplines of the biological cycle, including in the educational process the results of research on regional bioresources of the Irtysh River. A pedagogical experiment on the introduction of a regional component was conducted among students of 3-4 courses in the discipline "Bioresources of Kazakhstan" in the 2018-2019 academic year. During the experiment, the quality of knowledge about the bioresources of the Pavlodar region increased by 35%. A survey at the end of the course showed that 95% of students had mastered the material about regional bioresources, 80% expressed a desire to study regional bioresources in depth, and the same number of students

supported the idea of introducing a full-fledged elective course "Bioresources of Pavlodar region".

The degree of novelty of the obtained results and conclusions:

The first result is partially new from the standpoint of methodological substantiation of general scientific and interscientific approaches to the disclosure of the essence and definition of the theoretical basis for the application of the regional component in the training of future biology teachers.

The second result is important and new, since the problems of training future biology teachers related to insufficient educational and methodological material and the lack of specialized techniques have been identified. As a result, a training aid «Workshop on regional hydrobionts» was developed, aimed at deepening students' knowledge of local biota and improving their methodological training.

The novelty of the *third result* is that the content and methodology of the developed training aid have been tested in experimental conditions. Its effectiveness in improving the level of environmental culture, professional competencies and actual skills of future biology teachers has been confirmed.

The novelty of the *fourth result* is a pedagogical experiment on the introduction of a regional component in the process of training future biology teachers. The importance of the experimental results obtained has been clarified and analyzed. The results of the dissertation research and the conclusions drawn can become the basis for future scientific research in this direction, and can also be widely used in higher educational institutions, secondary vocational educational institutions, as well as in general education schools, in the system of professional training of teaching staff, and their professional development.

Compliance with the directions of science development or state programs:

The main idea of the thesis corresponds to the Law of the Republic of Kazakhstan. On education: adopted on July 27, 2007, No. 319-III (with amendments and additions as of 02/21/2019); Resolution of the Government of the Republic of Kazakhstan. On the approval of the national project "Quality education "Educated Nation": approved on October 12, 2021, No. 726; State Educational Standards of the Republic of Kazakhstan: approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018, No. 604.

Description of the doctoral student's contribution to the preparation of each publication:

25 scientific papers have been published on the topic of the dissertation, including 1 article in the journal included in the Scopus database (CiteScore percentile equal to 80%), 4 articles in publications recommended by the authorized body of the Ministry of Internal Affairs of the Republic of Kazakhstan, 5 articles in the proceedings of international conferences, 2 patents for a utility model of the Republic of Kazakhstan, 2 patents for inventions of the Republic of Kazakhstan, 6 publications in the scientific journal "Biological Sciences of Kazakhstan, 5 teaching aids.

Publication in publications included in the scientometric databases Web of Science and Scopus: The use of a regional component in the actual training of future biology teachers. Sci Herald Uzhhorod Univ Ser Phys. 2024;(55):2108-2117. DOI: 10.54919/physics/55.2024.210vr8. (Co-authored by Bazarbekov K., Tarasovskaya N.,

Khamzina Sh., Kabdolov Zh.) The doctoral student's contribution to the preparation of the publication is 80%.

Publications in publications included in the list of Science and Higher Education Quality Assurance Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan-4:

1. Fishery reservoirs of the Irtysh river basin and the age structure of populations of background species of commercial fish. Bulletin of the Shakarim State University of Semey, 2019. - No. 4. - 187-194 p. (Co-authored: Kabdolov Zh.R., Bazarbekov K.U., Tarasovskaya N.E.). The doctoral student's contribution to the preparation of the publication is 75%.

2. On the issue of the introduction of a regional component in the biological disciplines of the natural and mathematical cycle. Bulletin of Toraigyrov University Pavlodar: ToU, 2020. – No. 3. – 251-263 p. (Co-authored by Bazarbekov K.U., Tarasovskaya N.E., Khamzina Sh.Sh.). The doctoral student's contribution to the preparation of the publication is 80%.

3. The results of the implementation of the author's program of multilingual education in the training of future biology teachers. Biological sciences of Kazakhstan. – Pavlodar: PPU, 2020. – No. 4. – 45-55 p. (Co-authored by Bazarbekov K.U., Tarasovskaya N.E., Khamzina Sh.Sh.). The doctoral student's contribution to the preparation of the publication is 80%.

4. The use of multilingualism in excursion classes in biology (on the example of the greenhouse of the children's and youth center for ecology and tourism). The herald of KarSU.- Karaganda, 2021.-No.1.- 53-65 p. (Co-authored: Morosh A.M., Tarasovskaya N.E., Kamzina Sh.Sh., Solovyov S.A.). The contribution of the doctoral student to the preparation of the publication is 70%.

Educational and methodical manuals:

1. Workshop on regional hydrobionts: A textbook. - Pavlodar: Publishing house of Pavlodar Pedagogical University, 2020. -334 p. (Co-authored: Tarasovskaya N.E., Zhumadilov B.Z., Bazarbekov K.U.). The doctoral student's contribution to the preparation of the publication is 80%.

2. Excursions to natural biotopes and natural science museums with multilingual content: Educational and methodical manual - Almaty: Espi, 2022. - 164 p. (Co-authored: Tarasovskaya N. E.). The doctoral student's contribution to the preparation of the publication is 50%.

3. Hydrobionts: why are they called that?: educational and methodical manual- Almaty: Espi, 2022. - 120 p. (Co-authored: Tarasovskaya N. E., Kabdolov Zh.R.). The contribution of the doctoral student to the preparation of the publication is 60%.

4. Linguistic excursions infield practice in botany: An educational and methodological manual- Almaty: Espi, 2022. - 208 p. (Co-authored: Tarasovskaya N. E., Klimenko M.Yu.). The doctoral student's contribution to the preparation of the publication is 40%.

5. Linguistic field trips in zoology: An educational and methodological guide - Almaty: Espi, 2022. - 168 p. (Co-authored by: Tarasovskaya N. E., Kabdolov Zh.R.). The doctoral student's contribution to the preparation of the publication is 50%.

Two patents for inventions have been obtained:

1. Patent of the Republic of Kazakhstan №34411 "Composition for the preservation and embalming of cold-blooded vertebrates and internal organs of animals." Bulletin №32, class A01N 1/00 (2006.01). - 5 pages. (Co-authors: Kabdolov Zh.R., Tarasovskaya N.E.). The doctoral student's contribution to the preparation of the publication is 50%.

2. Patent of the Republic of Kazakhstan №34349 "Method for creating academic models of small animals with elements of sculptural taxidermy." Bulletin №23, class A01N 1/00 (2006.01). - 4 pages. (Co-authors: Kabdolov Zh.R., Tarasovskaya N.E., Bulekbaeva L.T.). The doctoral student's contribution to the preparation of the publication is 50%.

Two patents for utility models have been obtained:

1. Patent of the Republic of Kazakhstan №4404 "Method for creating exhibits of fish, amphibians, and reptiles." Published on 01.11.2019, Bulletin №44, class A01N 1/00 (2006.01). - 4 pages. (Co-authors: Kabdolov Zh.R., Tursunkhanov K.M., Tarasovskaya N.E.). The doctoral student's contribution to the preparation of the publication is 50%.

2. Patent of the Republic of Kazakhstan №4405 "Method for creating collection specimens of fish and other cold-blooded vertebrates." Published on 01.11.2019, Bulletin №44, class A01N 1/00 (2006.01). - 3 pages. (Co-authors: Kabdolov Zh.R., Tarasovskaya N.E.). The doctoral student's contribution to the preparation of the publication is 50%.