

## ANNOTATION

**of Aiman Karabalayeva's dissertation work on the topic "Monitoring of indicators of the visual system of students and scientific and methodological foundations for the implementation of results in higher education", submitted for defense for the degree of Doctor of Philosophy PhD in the specialty "6D011300-Biology"**

**Research topic.** "Monitoring of indicators of the visual system of students and scientific and methodological foundations of the implementation of results in higher education".

**The purpose of the study** is to monitor the functional indicators of the visual system of the students of Kyzylorda and the introduction of scientific and methodological developments in the course of the discipline "Human and Animal Physiology".

**Research objectives:**

- to monitor the functional indicators of the visual system of students, to identify the types and dynamics of the growth of eye diseases;
- design recommendations and a system of preventive measures to improve students' vision;
- to develop and implement in the educational process a work program (syllabus) of the course of the discipline "Human and Animal Physiology" using educational and methodological materials aimed at forming students' knowledge of the visual system;
- to develop a structural and content model of an experimental study, to develop an electronic textbook on "Physiology of Humans and Animals", to prepare recommendations for the prevention of eye diseases. Analyze the methodology of the pedagogical experiment on the content, conduct and results of the pedagogical experiment.

**Research methods:** theoretical and empirical methods were employed in the study. The analysis of philosophical, psychological, pedagogical and methodological literature served as the basis for the theoretical construction of the study. Empirical research methods allowed generalizing domestic and foreign experience in the field of biological education. Mathematical processing of the results of the study based on elemental analysis was based on a survey and questionnaire, long-term monitoring.

**The main provisions submitted for defense (evidence-based scientific assumptions and other inferences that are new conclusions).**

- monitoring of the functional indicators of the visual system of students was carried out, the types and dynamics of the growth of eye diseases were revealed. A study of the state of the visual system of students was conducted. During the monitoring, questionnaires were designed to identify various eye diseases, such as visual acuity, eye condition and others. The data obtained are important for the

development of measures for the prevention and treatment of eye diseases of students.

- recommendations and a system of preventive measures to improve students' vision have been designed. Based on the results of monitoring the visual system of students, recommendations and a system of measures aimed at improving the state of vision of students were developed. These activities include recommendations for a healthy lifestyle, proper diet, eye exercises and other methods to improve visual health.

- a working program (syllabus) of the discipline "Human and Animal Physiology" has been developed and implemented in the educational process using educational and methodological materials aimed at forming students' knowledge of the visual system. A program for the course "Human and Animal Physiology" has been designed and introduced into the educational process. This program includes learning materials, electronic textbooks and methodological recommendations that helped students to study aspects of the visual system in depth. The work program is designed to form students' complete and up-to-date knowledge about the functional aspects of vision, which can be useful both for their own health and for future professional activity.

- a model of pedagogical experiment has been developed that allows to identify effective teaching methods. The designed model of the formation of students' knowledge of the visual system, covering the integration of methodological developments in the pedagogical process, is a critically important means of providing students with relevant information and methods, contributing to a deep understanding of the functioning and diseases of the visual system. This model provides students with extensive knowledge about the visual system, and actively contributes to the formation of skills for the prevention and diagnosis of eye diseases.

**The main results of the study:**

- monitoring of functional indicators of the visual system in students was carried out, types and growth dynamics of eye diseases were identified. Monitoring the state of the visual system of students and analyzing the dynamics of eye diseases helped identify current problems in the field of visual health. These data provide the basis for the development of preventive and therapeutic measures.

- recommendations and a system of preventive measures to improve vision in students have been developed. These recommendations and the system of preventive measures represent an important step in improving the visual health of students. They cover various aspects of a healthy lifestyle, nutrition and exercise, which contribute to the overall improvement of the visual system.

- a work program (syllabus) for the course of the discipline "Human and Animal Physiology" was developed and implemented in the educational process using proprietary programs, educational and methodological materials, aimed at developing students' knowledge of the visual system. The implemented work program for the course "Human and Animal Physiology" allowed students to gain a deeper understanding of aspects of the visual system. This helps students develop

complete and up-to-date knowledge that can be useful both for their own health and for future professional activities.

- a structural and content model of experimental research has been developed, an electronic textbook on "Human and Animal Physiology" has been prepared, and recommendations have been developed for the prevention of eye diseases. The methodology of the pedagogical experiment is analyzed in terms of the content, conduct and results of the pedagogical experiment.

**Rationale of the novelty and significance of the results obtained:**

- the novelty of the first conclusion lies in the fact that new results on the study of eye diseases of students studying in Kyzylorda are presented for the first time. The functional indicators of the visual system of students were monitored. In order to assess the load of the visual system of students during their studies the questionnaire has been compiled and developed for interviewing students at the Korkyt Ata Kyzylorda University;

- the novelty of the second conclusion lies in the fact that the research results showed that the most common disease among the interviewed students is lacrimation during the use of various gadgets. This point was noted by 136 male and female students, which is 25.2%. Further, a common response was blurred vision. 111 male and female students answered that, which is 18.9%. The next common response was eye infections (many respondents noted conjunctivitis), 95 male and female students answered that, which is 10.1%, and redness of the eyes, headache. 91 male and female students answered that, which is 9.6%. In continuation and confirmation of the data gained, we obtained results on the percentage of use of various gadgets.

- the novelty of the third conclusion lies in the fact that methods have been developed and tested for the introduction of a methodological manual, an electronic textbook, recommendations and a system of preventive measures to improve students' vision in the educational process of the Korkyt Ata Kyzylorda University.

- the novelty of the fourth conclusion is that when integrating methodological developments into the pedagogical process, it focuses on practical training and allows students not only to assimilate theoretical knowledge, but also to apply it in real situations. This approach pays special attention to the development of skills and professional competence of students, which previously could have been insufficiently represented in traditional educational programs in this area.

**Correspondence with the directions of science development or state programs:**

The main idea of the research work corresponds to the Concept of development of higher education and science in the Republic of Kazakhstan for 2023-2029, the State Program "Digital Kazakhstan", the Address of the Head of State Kassym-Jomart Tokayev to the People of Kazakhstan dated September 1, 2023, the Law of the Republic of Kazakhstan "On Education" concerning the development of the kazakh education system, improving the quality of training of specialists, the State mandatory Standard higher education and educational programs.

**The contribution of the doctoral student to the preparation of each publication (the share of the author of the dissertation, measured as a percentage of the total volume of publications, is indicated)**

13 scientific papers have been published on the topic of the dissertation. Including:

- 1 article was published in a scientific journal indexed in the Scopus database;

- 5 articles – in publications approved by the Committee for Quality Assurance in the Field of Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan;

-7 articles – in the abstracts of international and republican scientific and practical seminars and conferences, 2 of which were published in the materials of foreign conferences.

All publications were prepared during the dissertation research.

1. Assessment of Biology Teacher Candidates' Attitudes and Competencies towards Virtual Reality Applications // International Journal of Emerging Technologies in Learning (IJET), 18(18), (2023) pp. 64-75. <https://doi.org/10.3991/ijet.v18i18.43219> (Co-authored by Ibadullayeva, S., Nurumov, B., Darzhuman, G., Nazarov, E., & Sumatokhin, S. The doctoral student's contribution to the preparation of the publication is 65%) (Scopus). The article reveals the possibility of using virtual reality in education. The descriptive analysis method was used in the analysis to research data.

2. Monitoring of the Visual System of Students in the Southern Region of Kazakhstan and the Implementation of the Results in the Methods of Teaching Biology. // INTERNATIONAL JOURNAL OF EDUCATIONAL REVIEW. 3. 103-123. 10.33369/ijer.v3i2.14580. (2021). (Co-authored by Ibadullayeva S., Abilova Sh. The doctoral student's contribution to the preparation of the publication is 70%). The article analyzes the methodological foundations of monitoring.

3. Monitoring of visual indicators of students in Kyzylorda, results, awareness and solutions // Scientific journal "Bulletin of the North Kazakhstan University named after M. Kozybayev" pedagogical series. Petropavlovsk No.3 (48) 2020, pp. 190-195, (Co-authored by Ibadullaev S.Zh., Abilova Sh.B. The contribution of the doctoral student to the preparation of the publication is 80%). The article describes the modern trends of the methodological foundations of the pedagogical process, presents a methodology for the formation of knowledge and skills of students.

4. Scientific and methodological foundations of basic training of pedagogical students. // Scientific journal "Bulletin of Toraigyrov University" pedagogical series, Pavlodar, 2020, No. 4. P. 260-268., (Co-authored by Ibadullaeva S.Zh., Abilova Sh.B. Doctoral student's contribution to the preparation of the publication is 80%). The article examined the scientific and methodological foundations of the basic training of pedagogical students.

5. The problem of health of the visual system of students in the theory and practice of learning in higher school // Journal "SCIENCE AND LIFE OF KAZAKHSTAN", Nur-Sultan, 2020, No. 12-1. pp. 347-351. (Doctoral student's

contribution to the preparation of the publication is 100%). The article examines the problems of the health of the visual system among students in the theory and practice of teaching in higher education.

6. The problem of the health of the visual system of students of Kyzylorda in the theory and practice of higher education. // Bulletin of the L.N. Gumilev Eurasian National University. Biological Sciences series No.2 (135), 2021, Nursultan; pp.6-17., (Co-authored by Ibadullaev S.Zh., Abilova Sh.B. The contribution of the doctoral student to the preparation of the publication is 75%). The article deals with the problem of the health of the visual system of the students of Kyzylorda in the theory and practice of higher education.

7. Priority issues of public health of student youth in a higher school. // Bulletin of Karaganda University. Pedagogy Series. №2 (102). 2021.- P.32-40., (Co-authored by Ibadullayeva S.Zh., Abilbek Zh., Abilova Sh.B., The doctoral student's contribution to the preparation of the publication is 75%). The article presents and analyzes priority issues of public health of university students.

8 Scientific formulation of biological research methods // 12 rep. Scientific conference of students and young scientists dedicated to the 1150th anniversary of Abu Nasir Al-Farabi. Bulletin of Korkyt Ata, Kyzylorda 2020, pp.86-88., (Co-authored by Ibadullaev S.Zh., Tazhieva E. Contribution of the doctoral student to the preparation of the publication is 75%). The article considers the scientific component of biological research methods.

9. The state of the visual system of students as a pedagogical problem. // Bulletin of the Korkyt Ata Kyzylorda University No. 1 (56), 2021 – pp.137-147. (Co-authored by Ibadullaev S.Zh., Abilova Sh.B. The doctoral student's contribution to the preparation of the publication is 70%). The article considers the state of the

10. Indicators of the immune system of residents of different Regions of the Aral Sea region, // Bulletin of the Korkyt Ata Kyzylorda University No.2 (57), 2021 – pp.114-120., (Co-authored by Ibadullaev S.Zh., Auezova N.S., Abilova Sh.B. Contribution of a doctoral student to preparation of the publication is 70%). The article analyzes the indicators of the immune system of residents of different regions of the Aral Sea region.

11. Digitization of the educational process in solving the problems of the education system of the Republic of Kazakhstan // Materials of inter. scientific and practical Conf. "Pedagogical innovations: a resource for the development of the modern education system" dedicated to the 60th anniversary of the scientist teacher Imzharova Z.U. - Aktobe, 2019, pp.786-787. (Co-authored by Maratkyzy S. The contribution of the doctoral student to the preparation of the publication is 70%). The article discusses the concepts of studying the digitalization of the educational process, and solving the problems of the education system of the Republic of Kazakhstan.

12. Evaluation of student-centered learning and involvement of students in the quality assurance system // Materials of the International scientific and practical Conf. "Pedagogical innovations: a resource for the development of the modern education system" dedicated to the 60th anniversary of the learned teacher

Imzharova Z.U. - Aktobe, 2019. pp. 184-186. (Co-authored by Ibadullaev S.Zh. The doctoral student's contribution to the preparation of the publication is 80%). The article considers the process of student-centered learning and the involvement of students in the quality assurance system of education.

13. The problem of "dry eye" syndrome in schoolchildren of the Aral Sea region. // Materials inter. scientific and practical conf. "Process Management and Scientific Developments" 2019, Birmingham, pp.173-179. (Co-authored by Ibadullaev S.Zh. The doctoral student's contribution to the preparation of the publication is 80%). The article considers the problem of "dry eye" syndrome in schoolchildren of the Aral Sea region.

Depending on the content of the doctoral student's dissertation, these publications represent the works performed mainly individually in accordance with the results obtained.