

ABSTRACT
of the doctoral dissertation for the degree of
Doctor of Philosophy (Ph.D) in the educational program
«8D01503 – Geography»

Autor: Gaukhar Bolatovna Aubakirova on the topic:
«Development of new information technologies for preparation to geography
Olympiads in schools of Kazakhstan»

Relevance of the research topic. At the present stage, the modernization of the education system of the Republic of Kazakhstan, the improvement of the quality of education, the development of students' intellectual potential, and the formation of a competitive personality are among the priority directions of state educational policy. Subject Olympiads play a particularly important role in achieving these objectives, as they contribute not only to increasing students' interest in academic disciplines, but also to developing their deep theoretical knowledge, logical thinking, analytical and research skills, as well as creative activity.

In the context of educational digitalization, the use of electronic educational resources, interactive platforms, and modern tools for data processing and visualization has become an important factor in improving learning efficiency. The potential of new information technologies is especially significant in geography, as the content of this discipline is closely related to cartographic materials, spatial information, digital data, and visual analysis. Their targeted and systematic use in preparing students for geography Olympiads not only deepens theoretical knowledge, but also develops analytical thinking, research abilities, and practical skills. The development of the education system in Kazakhstan is also closely linked to the United Nations Sustainable Development Goals. In particular, Sustainable Development Goal 4 – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” – emphasizes improving educational quality, effective use of digital technologies, and the development of students' functional literacy. This goal requires developing students' ability to work confidently in a modern digital environment, integrating innovative technologies into the educational process, and ensuring equal access to quality education. In this context, the use of new information technologies in geography Olympiad preparation is one of the important pedagogical tasks aimed at developing students' digital competencies, enhancing their research abilities, and fostering competitive individuals within the international educational space.

The relevance of the research topic is closely connected with the state educational development programs of the Republic of Kazakhstan, the directions of educational digitalization, and the objectives of supporting gifted children. The integration of new information technologies into the system of preparation for geography Olympiads contributes to increasing students' competitiveness in the international educational environment, developing their intellectual potential, and

creating favorable conditions for obtaining quality education. Therefore, the relevance of the study is determined, on the one hand, by the need to support gifted students and provide high-quality preparation for geography Olympiads in Kazakhstani schools, and on the other hand, by the need for the comprehensive and effective use of the potential of new information technologies in the context of educational digitalization. Addressing these contradictions served as the basis for choosing the research topic: «Development of new information technologies for preparation to geography Olympiads in schools of Kazakhstan»

The aim of the research is to develop, scientifically substantiate, and experimentally verify the effectiveness of a methodological system for preparing students for Geography Olympiads in schools of Kazakhstan on the basis of new information technologies.

To achieve this purpose, the following objectives were defined:

- to analyze the theoretical and methodological foundations of organizing preparation for geography Olympiads and the scientific and pedagogical prerequisites for the application of new information technologies;
- to examine the current state of the system for preparing students for geography Olympiads in schools of Kazakhstan and to identify its main problems and specific features;
- to develop an authorial methodological system for preparing students for geography Olympiads based on new information technologies, as well as a digital platform for its implementation;
- to determine the effectiveness of the authorial methodological system and digital platform through experimental research and to develop scientific and methodological recommendations for improving the system of preparation for geography Olympiads.

The object of the research the process of preparing students for Geography Olympiads in schools of Kazakhstan.

The subject of the research the application of new information technologies in preparing school students for Geography Olympiads.

The research hypothesis is as follows: if the process of preparing students for Geography Olympiads in schools of Kazakhstan is organized on the basis of a scientifically grounded methodological system based on new information technologies and systematically integrated into the educational process, it will contribute to improving students' subject knowledge, developing their functional literacy, spatial thinking, cartographic and analytical skills, as well as enhancing the quality and effectiveness of Olympiad task performance.

The theoretical and methodological basis of the research consists of conceptual provisions related to the scientific substantiation of the system for preparing school students for Geography Olympiads, the determination of the structure of Olympiad competence, and the identification of effective ways of forming it through information technologies.

The research problem is grounded in the works of domestic and foreign scholars in the field of pedagogical and didactic foundations of education, as well as the application of information and communication technologies in the

educational process (K.Z. Khalkova, Sh.T. Taubayeva, M.M. Zhanpeisova, A.K. Mynbayeva, G.K. Nurgaliyeva, E.S. Polat, V.P. Bospalko, G.K. Selevko, and others). Issues related to enhancing students' cognitive activity, developing information culture, and digital learning have been examined in the works of Zh.A. Karayev, K.M. Berkimbayev, E.Y. Bidaybekov, K.N. Mamirova, and others.

The issues of geographical education content, the development of spatial thinking, and the formation of cartographic and analytical skills are reflected in the works of A.B. Beisenova, O.B. Mazbayev, K.D. Kaimuldinova, B.Sh. Abdimanapov, R.A. Karatabanov, Zh.R. Baimetova, E.A. Akhmetov, N. Karmenova, Sh.Sh. Karibayeva, B.K. Assubayev, as well as Sh.U. Laiskhanov, N. Ussenov, D.T. Aliaskarov, and E.D. Isakov. The methodological foundations of geographical education are presented in the works of I.I. Barinova, V.P. Tamozhnya, V.P. Maksakovsky, and others, while issues of Olympiad movement and students' preparation for subject Olympiads have been studied by U.B. Zheksenbayeva, K.B. Bekishev, A.B. Satanov, A.S. Naumov, S.V. Ilyinsky, N.Kh. Agakhanov, V.V. Nikolina, V.V. Pasechnik, and others.

The peculiarities of geographical thinking, the content of Olympiad preparation, and international assessment have been explored in the studies of L. Chalmers, S. Berg, M. Barwiński, J. Van der Schee, J. Lidstone, M. Hemmer, X. Liu, H. Svobodová, P. Trahorsch, T. Bendl, D. Řezníčková, R. De Miguel González, M.L. De Lázaro Torres, and Eyup Artvinli. The mechanisms of giftedness development and high achievement were substantiated in the works of Joseph Renzulli, François Gagné, and Karl Ericsson.

In addition, issues of educational digitalization, multimedia learning, metacognition, and learning analytics were investigated by J. Siemens, R. Mayer, J. Flavell, and A. Riordan. Problems related to the development of a structural model of Olympiad preparation based on information technologies and the use of digital platforms are reflected in the works of De Miguel González, De Lázaro Torres, Bendl, Řezníčková, and others.

Research methods.

Theoretical methods: systematic analysis and synthesis of philosophical, pedagogical, didactic, methodological literature and Internet sources related to the research problem; examination of scientific works devoted to geographical education and the Olympiad training system; analysis of normative documents in the field of education; comparative analysis of the content and structure of Geography Olympiads; application of structural and content modeling methods.

Empirical methods: ascertaining and formative pedagogical experiments; observation of students' activities; conversations and interviews; testing to determine the level of knowledge; analysis of learning outcomes through a digital educational platform. Mathematical and statistical methods were used for processing experimental data and their graphical interpretation.

Scientific novelty of the research:

– a methodological system based on new information technologies for preparing students for Geography Olympiads in schools of Kazakhstan was developed;

- the authorial digital platform Geoolympiad.kz was developed to ensure the implementation of the proposed methodological system;
- the effectiveness of applying new information technologies in preparing students for Geography Olympiads was proven through the results of experimental research;
- scientific and methodological recommendations aimed at improving the system of preparation for Geography Olympiads were developed.

The theoretical significance of the research lies in clarifying the scientific-pedagogical and methodological foundations for organizing preparation for Geography Olympiads, as well as identifying the theoretical prerequisites for applying new information technologies in the Olympiad preparation process. During the study, the content, structure, and organizational features of preparation for Geography Olympiads were systematized, and the theoretical foundations of the authorial methodological system based on new information technologies were determined. The pedagogical potential of the proposed methodological system and digital platform was substantiated, and theoretical and methodological directions for improving the process of preparation for Geography Olympiads were identified.

The practical significance of the research is determined by the fact that the methodological system and authorial digital platform developed on the basis of the research results make it possible to systematically organize preparation for Geography Olympiads, ensure the step-by-step mastery of Olympiad tasks, monitor students' academic achievements, and improve the quality of preparation. The research materials can be used in general secondary schools, specialized educational institutions for gifted children, supplementary education centers, as well as in teacher professional development systems.

The main provisions submitted for defense are as follows:

1. The application of new information technologies in the process of preparing students for Geography Olympiads is an important pedagogical condition for developing students' subject knowledge, functional literacy, and spatial thinking.
2. The comprehensive use of the methodological system and the author's digital platform developed on the basis of new information technologies ensures the systematization of the content, stages, tools, and organizational mechanisms of Olympiad preparation; contributes to the effective presentation of educational materials; supports the organization of a system of tasks; and enables continuous monitoring of students' level of preparation.
3. The practical implementation of the proposed methodological system contributes to improving the quality of Olympiad task performance, increasing the level of students' geographical preparation, and enhancing the effectiveness of their participation in subject Olympiads.

Approbation of the research results: the main findings and conclusions of the study were presented and discussed at the following international scientific and practical conferences: the International Scientific Conference of Students and Young Scientists "Farabi Alemi" (Almaty, Kazakhstan, 2021–2023), the

International Scientific and Practical Conference “Science, Society, and Education in the Era of Digitalization and Global Changes” (Penza, Russian Federation, 2022), “The 5th International Conference on Languages, Translation/Social Sciences” (Antalya, Türkiye, 2022), as well as the II International Congress of Geographers of the Turkic World (Almaty, Kazakhstan, 2025).

Publications based on the research results: during the course of the study, 9 scientific works were published, including 2 articles in journals indexed in the Scopus database, 2 articles in scientific journals recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan, and 5 articles in the proceedings of international scientific and practical conferences. In addition, 1 educational and methodological manual, 1 collection of test tasks, and 1 copyright certificate were prepared and obtained. The research results were implemented into the educational process, and their effectiveness was confirmed by 3 implementation acts.

Structure of the dissertation. The dissertation consists of an introduction, three chapters, a conclusion, a list of references comprising 138 sources, 16 tables, 30 figures, and 5 appendices. The total volume of the dissertation is 159 pages.