

ABSTRACT

**of the dissertation on the subject «Methodological system of preparing future teachers of computer science for the use of cloud technologies in professional activities» for the degree of Doctor of Philosophy (PhD) in the specialty (6D011100-Informatics)
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Research subject: Methodological system of preparing future teachers of computer science for the use of cloud technologies in professional activities.

The purpose of the study: To theoretically substantiate and develop the methodological system for preparing future computer science teachers for the use of cloud technologies in their professional activities.

Research objectives:

- to analyze the existing approaches to the training of computer science teachers in modern education, to prove the need to prepare future computer science teachers to use cloud technologies in their professional activities;

- to develop the model for training future computer science teachers to use cloud technologies in their professional activities;

- to determine the purposes and content of training future computer science teachers to use cloud technologies in their professional activities;

- to identify the features of the methodology of preparing a future computer science teacher for the use of cloud technologies in professional activities, the main organizational forms and methods of training, to determine the criteria for the selection of cloud services as a means of teaching;

- to experimentally confirm the effectiveness of the proposed methodology for preparing future computer science teachers to use cloud technologies in their professional activities.

Research methods: theoretical analysis and synthesis of pedagogical, psychological and scientific-methodical literature, dissertations on the subject of research, analysis of educational standards, educational programs of professional training, questionnaires of students, methods of mathematical statistics.

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

The possibilities of using cloud technologies in education are revealed and the necessity of training future computer science teachers to use cloud technologies in professional activities is substantiated. The model, methodology and content of professional training of future computer science teachers to use cloud technologies have been developed, cloud services have been selected as a means of teaching future computer science teachers to cloud technologies.

The main results of the research:

- the need to prepare future computer science teachers to use cloud technologies in their professional activities is justified;

- the model for preparing future computer science teachers to use cloud technologies in their professional activities has been developed;

- the purposes and content of preparing future computer science teachers to use cloud technologies in their professional activities are determined;
- the methodology has been developed for preparing future computer science teachers to use cloud technologies, organizational forms and methods, criteria for selecting cloud services as a means of teaching have been defined.

Novelty and importance of the results obtained:

The first result is new, because the need to use cloud technologies and their services in the education system is due to one of the new paradigms, namely the paradigm of cloud technologies as distributed data processing technology. The essence of this paradigm is that computer resources are provided to the user as an Internet service. The development of cloud computing to the «software as a service level» ensures the availability of the use of cloud technologies in education, teaching, which entails the need to teach cloud technologies to computer science bachelors and future computer science teachers to use cloud technologies in professional activities.

The second result is new, because the proposed model of preparing future computer science teachers to use cloud technologies in their professional activities is holistic, built on the basis of an algorithm of effective specialist activity, provides for an assessment of the formation of competencies in cloud technologies.

The third result is new, because the content of the preparing of future computer science teachers has been selected in accordance with didactic principles. The content includes questions of the theoretical foundations of cloud technologies and topics that allow solving the tasks of a teacher's professional activity.

The fourth result is new, because the developed methodology for preparing future computer science teachers to use cloud technologies in their professional activities is focused on using the capabilities of the modern educational platform Google Classroom and Google Class developed on its basis in the core disciplines. The criteria for selecting cloud services as a teaching means follow from the cloud computing paradigm.

Compliance with the directions of science development or state programs:

IEEE/ISO/IEC 8802-IX-2013-IEEE/ISO/IEC Information technology-Telecommunications and information exchange between systems – Local and metropolitan area networks – Part IX: Port-based network access control; The national project «Quality Education « Educated Nation »»), approved by the Decree of the Government of the Republic of Kazakhstan dated 2021; The concept of development of higher education and science in the Republic of Kazakhstan for 2023 - 2029, approved by the Decree of the Government of the Republic Kazakhstan dated March 28, 2023 No. 248; Professional standard «Teacher», approved by the order of the Acting Minister of Education of the Republic of Kazakhstan dated December 15, 2022 №. 500.

The contribution of the doctoral student to the preparation of each publication (the contribution of the author of the dissertation is shown as a percentage of the total volume of the publication):

1. The effective use of telecommunication cloud services for the training of future computer science teachers // World Transactions on Engineering and Technology Education. – 2021. – Vol. 19, Iss. 4. – P. 398-403. (Sub-authors: Bidaibekov E., Grinshkun V., Bostanov B., Koneva S. – 40%, Bedelov K.A. – 60%).

2. Бұлттық технологияларға негізделген желілік сервистердің көмегімен болашақ информатика мұғалімдерін даярлау хақында // Abai Kaznpu Bulletin, Series «Physical and Mathematical Sciences». - №4(64). – Almaty, 2018. – P.127-130. (Sub-authors: Bidaibekov E.Y., Bostanov B.G., Jambaeva R.A. – 60%, Bedelov K.A. – 40%).

3. Бұлттық технологиялар және оларды білім беруде пайдалану мүмкіндіктері // Abai Kaznpu Bulletin, Series «Physical and Mathematical Sciences». - № 4 (68) – Almaty, 2019. – P. 196-200. (Sub-authors: Bostanov B.G. – 40%, Bedelov K.A. – 60%).

4. Принципы отбора содержания обучению облачным технологиям в педагогическом вузе // Abai Kaznpu Bulletin, Series «Physical and Mathematical Sciences». - №3 (71) – Almaty, 2020. – P. 158-162. (Sub-authors: Bidaibekov E.Y., Bostanov B.G., Koneva S.N. – 60%, Bedelov K.A. – 40%).

5. Особенности методической и предметной подготовки будущих учителей информатики // Materials of the 25th International Scientific and Practical Conference «Innovations in Professional and vocational pedagogical Education». - Ekaterinburg, 2020.- P. 135-137. (Sub-authors: Bostanov B.G. – 40%, Bedelov K.A. – 60%).

6. Особенности обучения в условиях облачных технологий // Collection of articles of the IV All-Russian Scientific and Practical Conference «Actual problems of theory and practice of teaching mathematics, computer science and physics in the modern educational space». - Kursk, 2020. – P. 272-274. (Sub-authors: Bidaibekov E.Y., Bostanov B.G., Koneva S.N. – 60%, Bedelov K.A. – 40%).

7. Особенности методической подготовки будущих учителей информатики в педагогическом вузе Казахстана // Materials of the VI International Scientific Conference «Informatization of education and e-learning methodology: digital technologies in education Информатизация образования и методика электронного обучения: цифровые технологии в образовании». P.1. – Krasnoyarsk, 2022. – P. 190-194. (Sub-authors: Bidaibekov E.Y., Koneva S.N. – 50%, Bedelov K.A. – 50%).

8. Бұлттық технологияның білім беру жүйесіндегі алатын орны мен артықшылықтары // Sadykov readings-materials of the V International Scientific and practical conference «Actual problems of modern education and science».- Almaty, 2018. - P. 69-71. (Sub-authors: Bidaibekov E.Y., Bostanov B.G. – 50%, Bedelov K.A. – 50%).

9. Организация занятий по облачным технологиям с использованием метода виртуализации // Materials of the IX International Scientific Conference «Problems of Differential Equations, analysis and Algebra»- Aktobe, 2022. - P.

127-131. (Sub-authors: Bidaibekov E.Y., Koneva S.N. – 50%, Bedelov K.A. – 50%).