

ANNOTATION

dissertation work of Rima Ergalievna Abdualieva on the topic "Scientific and methodological foundations of using Case technology in the formation of information competence of mathematics teachers", submitted for the degree of Doctor of Philosophy (PhD) in the educational program 8D01501- "Mathematics"

Actuality of the study.

Modern society needs educated, enterprising specialists who are able to make effective decisions in difficult life situations and are ready to constantly develop their professional qualities.

In the Message of the Head of State Kassym-Jomart Tokayev to the people of Kazakhstan dated September 2023, "The Economic benchmark of a fair Kazakhstan", it says: "The inalienable right of every child is the right to receive a high-quality school education. And the word "quality" is the key here. Therefore, it is necessary to consistently improve the quality of education and improve the competence of teachers."

Quality education is in the hands of a qualified teacher. Quality education is a key factor in the successful development of students. A teacher plays a crucial role not only in acquiring knowledge and skills, academic achievements of students, but also in shaping the realization of their potential in society. Therefore, deep methodological and theoretical training of a future teacher is always relevant.

In recent years, the basis of education has been the competence of teachers. Teachers who have developed professional competence have a tendency to organize knowledge and obtain quality results that students should have.

The issue of professional competence is widely studied in the scientific literature.

The theory of professional competence has been studied in the works of scientists:

- domestic S.Zh.Praliev, B.A.Turgunbaeva, B.T. Kenzhebekov G.Zh. Menlibekova, K.S. Kudaibergenova, K.M. Berkimbaev, N.M. Nurgazieva
- Russian I.A.Zimnyaya, R.P.Milrud, E.F.Zeer, T.M.Balykhina, A.V. Khutorsky, G.R. Lomakina, O.P. Morozova;
- foreign R. Bowes, R. Boyatsis, D. McClelland, J. Raven, G. Roberts, A. Stoof, P. Andersson and others.

Various aspects of competence developed by specialists have been studied by the following scientists: G.Zh.Niyazova, Sh.T.Taubaeva, K.S.Kudaibergenova, B.T.Kenzhebekov, G.M.Kasymova, S.S.Kunanbaeva, G.T Kydyrbaeva and others.

Problems of communication skills in the formation of professional competence are considered in the works of F.Sh. Orazbaeva, S.R. Rakhmetova and others.

In recent years, research on innovative views on the formation of professional competence has been carried out by: M.S.Moldabekova, T.M.Esingalieva, K.O.Orazbaeva, D.K.Sadirkbekova, G.A. Rizakhodjaeva and others.

In their works, N.N. Abakumova, S.V. Tirishina, A.S. Karpechenko A.V. Khutorsky explore the problem of information competence in the formed competencies of specialists.

The meaning of the concept of «information competence» was studied in different directions in their works:

- domestic A.E. Abylkasymova, M.Zh.Zhadrina, K.Zh.Aganina and others.

- Russian N.I. Gendina, S.D. Karakozov, O.A. Kizik, N.H. Nasyrova, V.A. Fokeeva, O.B. Zaitseva, A.L. Semenova, N.Yu. Tairova;

- foreign Barno Abdullaeva, A. Lloyd, C. Gibson, DeMars, A.A. Ojedokun and other scientists.

We learned that their research contributed to the understanding and development of information competence in a variety of educational and professional settings, and their work helped shape standards and methods for teaching information literacy.

However, when reviewing and analyzing the works of scientists, the concept of “information competence” was described from different sides, in different directions, but we were not able to see a generalized summary conclusion.

Most authors agree that information competence is a multi-level category, and in different studies one can find a different number of levels of information competence. They basically form a hierarchy of levels, each of which includes features of the previous level and may have features that differ from it. As one moves forward along the hierarchical ladder, new thoughts and thinking are formed, the result of which is information competence.

A feature of information competence is continuity, since initial skills are formed at school and continue to develop at university and throughout life.

The development of information competence in accordance with the continuity of information competence and modern demand is one of the pressing problems of our time. During the search and study of various ways to form and develop information competence, the following contradictions were identified. In particular:

- increased need for the formation of information competence in the structure of the personality and professional activity of a teacher and insufficient theoretical and technological development of it in pedagogical science;

- public demand for the development of information competence of mathematics teachers and the lack of implementation of this problem in practice;

- among the large amount of information (educational and methodological material in traditional printed and electronic formats), there is no methodology that develops the teacher's ability to work with information and effectively use it in professional activities.

The identified contradictions determined the research problem. The need for a teacher with a high level of information competence in accordance with the requirements of modern society and his psychological and pedagogical justification in the search for ways to form and develop information competence determined the topic of the dissertation work «Scientific and methodological foundations for the use of Case Technology in the formation of information competence of mathematics teachers».

Purpose of the study: To determine the pedagogical conditions for the formation of information competence of mathematics teachers using Case Technologies and the practical justification for their implementation.

Object of the study: the process of teaching mathematical disciplines in higher educational institutions.

Subject of the study: methodology for using case technology in the development of information competence of mathematics teachers.

Hypothesis of the dissertation research: if the pedagogical conditions for the formation of information competence of mathematics teachers using Case technology are determined, a methodology for its use is created and implemented in the educational process, **then** it is possible to ensure a sufficient theoretical and methodological level of formation of information competence of mathematics teachers, since it forms the information competence of mathematics teachers and promotes their development.

Research objectives:

1. Determination of the content features of information competence;
2. To formulate pedagogical conditions for the use of Case technology in the formation of information competence of mathematics teachers;
3. Create a structural and content model for the use of Case technology in the formation of information competence;
4. Develop a methodology for using case technology in developing the information competence of mathematics teachers;
5. Experimental testing of methods for implementing the methodology of using Case Technology in the formation of information competence of mathematics teachers.

To achieve the goal and solve the assigned problems, the following research methods were used:

- *general scientific methods of theoretical research:* analysis of educational standards, curricula, textbooks, teaching aids, educational and methodological complexes, mathematical, psychological, pedagogical and methodological literature, experience in teaching mathematics, processing and generalization of the results obtained.

- *methods of social research*: participation in classes of mathematics teachers, oral and written conversations with teachers and students, undergraduates and school teachers, questionnaires, testing.

- *empirical research methods*: conducting a pedagogical experiment to confirm the research forecast, analysis and processing of the experiment results using statistical research methods.

The theoretical and methodological basis of the study was:

- scientists who studied the field of general information competence:

domestic A.E.Abylkasymova, Sh.O.Omarbekova, G.I.Muratova and Russian scientists S.V.Trishina, A.V.Khutorskoy, O.B.Zaitseva, N.G.Vitkovskaya, A.A.Akhayanin, etc.

-the direction of teacher training for the use of information and communication technologies: T.O.Balykbayev, E.Y.Bidaibekov, K.M.Berkimbayev, K.Kabdykirov, Zh.A.Karaev, S.M.Kenesbayev, M.S.Malibekova, B.D.Sydykov, G.O.Tazhigulova, L.A.Shkutina, N.Zh.Zhanatbekova, B.Zh.Nurbekov, G.T.Kydyrbayeva, A.O.Aldabergenova, etc.;

- methodological features of teaching mathematics B.Baymukhanov, D.Rakhimbek, A.M.Mubarakov, A.N.Nugusova, S.M.Seitova, D.N.Nurgabyl, E.J.Smagulov and others.

- information competence of teachers in the field of mathematics: A.E.Abylkasymova, T.O.Balykbayev, E.I.Bidaibekov, K.M.Berkimbayev, Zh.A.Karaev, A.K.Bekbolganova, etc.

Research sources:

Message to the People of Kazakhstan dated September 01, 2023 "Economic orientation of a fair Kazakhstan". Resolution of the Government of the Republic of Kazakhstan dated March 28, 2023 №248; The message of Kassym-Jomart Tokayev to the people of Kazakhstan dated September 1, 2022; the state mandatory standard of higher education, educational programs, work curricula, educational and methodological complexes; philosophical, psychological, pedagogical, methodological works on education and teaching mathematics.

Scientific novelty of the research:

1. The content features of information competence are substantiated;
2. The pedagogical conditions for the use of Case Technology in the formation of information competence of mathematics teachers are determined;
3. A structural and content model for the use of Case Technology in the formation of information competence has been created;
4. A methodology has been developed for using case technology in the formation of information competence of mathematics teachers;
5. The ways of implementing the methodology of using Case technology in the formation of information competence of mathematics teachers were tested

experimentally, and the correctness of the results obtained was proven on the basis of mathematical statistics.

Theoretical significance: the use of Case technology is aimed at the formation and development of information competence of mathematics teachers that meets the basic requirements of higher pedagogical education.

Practical significance: lies in the fact that the dissertation research contains material that can be used by future mathematics teachers, training areas "6B015 - Teacher training in natural science subjects" in the educational program "Mathematics", "Mathematics and Computer Science". At the same time, the electronic manual, which creates a methodology for using Case technology and Case tasks, can be presented as a methodological instruction to students and school teachers.

Reliability and validity: analysis of scientific and educational literature on the problem under study; application of a complex of scientific research methods; rational combination of theoretical and experimental types of research; carrying out statistical methods confirming the results of the experimental study, using thematic processing.

The following provisions are submitted for defense:

1. The theoretical basis is the substantiated substantive features of information competence and the formulation of pedagogical conditions for the use of Case technology in the formation of information competence of teachers;
2. The methodological basis of the study may be the requirements for the use of Case technology and the structural and content model of the use of Case technology;
3. The method of using Case Technology in developing the information competence of mathematics teachers improves the professional training of mathematics teachers and meets the basic requirements of higher pedagogical education.

Research base: experimental studies were carried out on the basis of the Higher School of Natural Sciences of Zhetysu University named after Ilyas Zhansugurov, Kazakh National Women's Pedagogical University, KMM "Secondary School No. 49 named after Koshke Kemengeruly" in Astana, "Gymnasium School No. 80 named after S. Seifullin" Astana, KMM "Secondary school No. 4", Taldykorgan.

Stages of research. Experimental work in accordance with the goals and objectives of the study was carried out in the period 2020-2023. within the educational process and consisted of three stages:

At the first stage (2020-2021), an analysis of educational, educational and methodological literature related to the problem posed was carried out. At this stage, the methodological, psychological and pedagogical aspects of the formation of information competence of teachers in the field of education were studied. The data obtained during the experiment on theoretical analysis and

identification of literature served as the basis for formulating the purpose and objectives of the study and presenting the work forecast.

At the second stage (2021-2022), it was formulated that one of the ways to form and develop the information competence of teachers is Case technology, and specific recommendations were developed for the creation of Case tasks and their use. (search experiment)

At the third stage (2022-2023), an experiment was conducted to clarify the theoretical questions of the research work; During the experiment, the methodology for using Case technology in the formation of information competence of teachers was tested. The obtained theoretical and experimental results were processed, generalized, its effectiveness was proven, and introduced into the process of training mathematics teachers.

Approbation and implementation of research into practice:

The conclusions and results of the study were heard and discussed at a scientific and methodological seminar of the Higher School of Natural Sciences of Zhetysu University. I. Zhansugurova, and are also reflected in the textbook "Methodology for applying Case Technology to the formation of information competence of teachers." It was also reported and discussed during a scientific internship at the Department of Mathematics of the Institute of Physics, Mathematics and Digital Technologies of the Kazakh National Women's Pedagogical University (Almaty, Kazakhstan).

From May 2 to May 13, 2023, at the Center for Advanced Training and Continuing Education at the Education Department of Zhetysu University named after I. Zhansugurov, an advanced training course was held on the topic "Ways to develop the information competence of mathematics teachers" for teachers and mathematics teachers of secondary schools in the Zhetysu region, .Taldykorgan (36 academic hours).

Publications: The main results and provisions of the dissertation research have been published in various scientific journals and collections,

conference materials, a total of 11 papers, including:

1. Scientific papers published in the Scopus-1 database; (percentile-99, quartile –Q1);

2. Articles in journals included in the list of peer-reviewed scientific publications determined 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-3;

3. Scientific papers published at international scientific and practical conferences - 4;

4. Scientific papers published in foreign peer-reviewed journals-2;

5. Textbook-1 recommended by the Academic Council of the University;

6. Copyright certificate-1 (Appendix B).

The structure and content of the dissertation.

The dissertation consists of normative references, abbreviations, an introduction, two parts, a conclusion, a list of references and appendices.

The introduction discusses the purpose, object, subject of research, scientific forecast, tasks, theoretical and methodological foundations, stages and methods of research, research base, scientific novelty, theoretical and practical significance and principles proposed for protection, validity of research results.

In the first part, entitled "Theoretical foundations of the formation of information competence of mathematics teachers": 1) Psychological and pedagogical aspects of the formation of information competence, 2) Pedagogical conditions for the use of Case technology in the educational process, 3) Case technology is presented as one of the ways to form the information competence of mathematics teachers.

In the second part, entitled "The methodology of using Case technology in the process of teaching mathematics": 1) Requirements for the use of Case technology in the formation of information competence of mathematics teachers, 2) Methodological system for the use of Case technologies in the process of teaching mathematics 3) The experiment and its results were processed quantitatively and qualitatively.

In conclusion, the main results of the dissertation research are formulated, as well as conclusions and recommendations for their further use in research in the field of pedagogy and mathematical education, as well as prospects for further research.

List of used sources: in the process of conducting the dissertation research was used sources consisting of 140 titles.

The appendix presents the material developed in the course of the research, not included in the thesis work and acts of implementation.