

ANNOTATION

On the dissertation for scientific degree of Doctor Philosophy (PhD) in
specialty 6D010900 - Mathematics

Muratbekova Moldir Abdrazakovna

«Methodology for the formation development of search and research of
students in the course «Differential Equations in Partial Derivatives»

Actuality of the research

In a message from January 31, 2017, "The Third Modernization of Kazakhstan: Global Competitiveness" to the Kazakh nation, the President N.A. Nazarbayev said: "The fourth priority is the improvement of the quality of human capital. First of all, the role of the education system must be changed. Our responsibility is to make education the central link in a new model of economic growth. Curriculum should be aimed at developing the abilities of critical thinking and the skills of self-searching the information. " Hence, one of the main goals of higher education institutions is the preparation of a future specialist corresponding to the demands of the time.

Development is an innovative process, realized through the search for information and the process of understanding. It is necessary to form the ability of students in research, in solving big and small problems independently, in conforming the requirements of time and competitiveness. Therefore, important issues in the training of specialists are mastering the methodology of students in the learning process and acquiring the methodology by scientific research.

Based on modern scientific and practical achievements, it is aimed to conscious citizens, ensure the comprehensive development of the student, improve the spiritual, creative power of man and train focused on growing of professionalism, development and personality formation.

Education as a competitive, adhering to the creative direction in all actions, the competitor, the deeply educated specialist starts from the requirements of the time, i.e. a student in social life should not be limited in obtaining general information. In all fields of science, the content of knowledge becomes deeper, while its coverage is growing, during the period of modern scientific and technological development, the implementation of these goals is directly related to the formation of students' research and self-developing abilities.

Along with the high professional training of today's youth, they must independently (creative) explore the world around them. In fact preparing students in higher educational institutions for research, scientific and pedagogical work, is a social and pedagogical issue.

The Law of the Republic of Kazakhstan "On Education" states that one of the main tasks is the development of the creative, spiritual and physical abilities of the individual, the formation of strong bases of morality and a healthy lifestyle, enriching the intellect by creating conditions for the development of individuality.

The emergence of an independent state of the Republic of Kazakhstan, the creation of a market model for the direction of the economy, is explained by the objective factors of the new direction and the feature of the education introduced

into the system of national education. The fundamental renewal of society, is impossible without the training of specialists. The main role in providing specialists is played by higher schools.

New relations in the formed educational process in the conditions of the higher school, the formation of a specialist capable of creative thinking, competent, meeting the requirements of a significantly renewed society means a fundamental renovation.

This is concluded in improving the quality of the training of the main current specialists in the higher education system, in constant close connection with the requirements of the economic and social field of research of higher education institutions, the integration of research activities, the development of innovative education, and the improvement of information and educational technology.

The methods of learning activities serve as a indicator in the period of the fulfillment of the study assignments for the students. It makes it possible to organize the order of the actions to be performed. But schools and higher educational institutions do not pay enough attention to the process of forming receptions, especially, search and research activities.

This search and research activity not only directs the actions of students during the creative process, but also represents the first steps towards the development of skills to conduct research and use the knowledge gained in various life situations. Therefore, their purposeful formation is necessary.

One of the main works carried out in this area in higher education institutions and general education schools is the renewal of knowledge of the foundations of the science of mathematics.

Formation, development of search and research activities of the student, through their publications, the students confidence in creative search, skills will develop, the skills of generalizing thinking. Students will be initiative, active in research views, writing scientific works.

Today, many scientists and teachers, researchers of the university system of education, note the decline in the general level of mathematical education, manifested, primarily, in the formal adoption by students of mathematical facts and theories. Not all students have the same level of preparatory to higher education, and especially to the study of the course "Differential Equations in Partial Derivatives." Assimilation of the fundamentals of this course plays an important role in the development of the student's professional training. When studying the course "Differential Equations in Private Derivatives" most students of mathematical specialties of universities face a number of difficulties of a logical nature that emanate from the essence of this discipline. This is due to their inadequate mastery of the methods of the relevant training activities.

Necessity of solving the tasks set by the society towards the modern education system, the requirements for a new type of teacher-the graduate of the university, the leading type of their professional activity, the lack of special means to activate the thinking activity of students at all levels of training, the significance of the course "Differential Equations in Private derivatives "for the fundamental

training of mathematics teachers determine the relevance of the chosen research topic.

The indicated range of issues that determine the relevance of the research topic implies the solution of a number of contradictions. This is a contradiction between:

- the predominance of "knowledge" training with the leading information and explanatory method in the process of preparing future mathematics teachers individually - the creative, research character of the teacher's activity;

- the need of university teachers in the theoretical and methodological justification of the process of organizing search and research activities of students in teaching the course "Differential Equations in Partial Derivatives" and the insufficiently developed theory, methodology and corresponding system of problems;

- the need for students to participate in research activities not only in the process of studying at a university, but also in further pedagogical activity, which requires them to use productive methods of instruction, to prepare their students for participation in conferences, to involve them in independent "discoveries" and at the same time, corresponding methods of activity.

These contradictions the problem of scientific research, consists of an answer to the question of how the method of formation of research and research activity should be by means of teaching the course "Differential Equations in Private Derivatives" to students in higher educational institutions?

Aim of research - Development of a methodology for the formation of search and research activities in the learning process of the course "Differential Equations in Private Derivatives" for students.

Object of research - The learning process of the course "Differential Equations in Private Derivatives" for students of mathematical specialty in universities.

The subject of research: The process of formation of research and research activities of students in the course "Differential Equations in Partial Derivatives".

Scientific forecast of the research: Using the methods of research and research activities for students in higher education institutions, and also basis the compilation of a set of tasks, the presentation of the methodology for the formation of research and development activities through the training of the course "Differential Equations in Partial Derivatives" helps to form the search and research activities of future specialists.

Objectives of the study:

- Disclosure of the content of the concept of "Search and research activities", the definition of the foundations of the psychological and pedagogical process of formation of search and research activities for students;

- determination of methods of search and research activities used in the learning process in universities;

- Creation of a set of tasks that enable the organization of research and research activities in students in teaching the course "Differential Equations in Partial Derivatives";

-Development of the methodology for the formation of search and research activities through the training course "Differential Equations in Private Derivatives" for students, to reveal the effectiveness of its educational process by the experiment.

Methodological and theoretical bases of research:

- Scientific and philosophical knowledge about search and research activities in the learning process, ideas and theories about the formation of research and search activities of students, didactic and methodological views.

Methods of research:

- Theoretical analysis of the psychological-pedagogical, methodical literature and modern periodicals on the research problem;

- Analysis of the content of the university course "Differential Equations in Partial Derivatives";

- Observations, questioning, individual interviews, control tasks;

- Carrying out a pedagogical experiment;

- Processing of experimental results: methods of mathematical statistics.

Scientific novelty and theoretical significance of the research:

1. The conceptual apparatus of the process of formation of search and research activities of students has been clarified, the methods of search and research activity have been identified (problem statement, forecast presentation, proof of forecast), the foundations of the psychological and pedagogical formation of search and research activities in the course of training courses "Differential Equations in Partial Derivatives" Specialty students in mathematics;

2. Methods of search and research activity by students in the course of the course "Differential Equations in Partial Derivatives" were defined, a set of tasks necessary for their formation was developed.

3. The methodology for the formation of search and research activities in the learning process of the course "Differential Equations in Private Derivatives" by students was developed.

4. The effectiveness of the methodology for the formation of search and research activities was verified and introduced into the learning process.

Practical significance of the study:

Based on the results of the research, a methodical instruction was prepared, the program of the training course "Differential Equations in Private Derivatives" intended for students of higher educational institutions and introduced into the learning process. Research results can be used in the formation of cognitive activity of students in higher educational institutions, in institutes for improving professional knowledge by specialists in mathematics and teachers in the subject of mathematics, improving the quality of the educational process, in general schools Ah, college.

Stages of research. At the first stage (2010-2013), observations, questioning of first-year students and schoolchildren, participants in scientific and practical conferences, discussions with university professors were conducted; Conditions were identified that contributed to the formation of research skills and clarified the research problem.

The second stage (2013 - 2014) was used to analyze general and specialized literature on the research problem; the object, subject, purpose was clarified, the hypothesis was investigated and task was determined; Observation the training course "Differential Equations in Private Derivatives" and the work of students in the classroom, conversations with students; a model of the process of forming methods of search and research activities was developed, special problems were formulated for the course "Differential Equations in Partial Derivatives," a direction for solving such a model; work was carried out on the establishment of the developed model for the formation of methods of search and research activities of students in the practice of training.

At the third stage (2014-2018), a shaping experiment was organized and conducted, the experimental data were processed, the conclusions of the study were formed, the text of the dissertation was executed.

The reliability and validity of the results and conclusions of the research are provided by reliance on the fundamental position of modern psychology, pedagogy and methods of teaching mathematics, the internal logic of research, the use of methods adequate to the tasks posed, the results of the pedagogical experiment, the authenticity of the hypothesis that has solidified at qualitative levels.

Basic provisions to be protected:

1. The substantiation of the psychological-pedagogical formation of search and research activity through the training of the course "Differential Equations in Private Derivatives" for students;
2. A set of problems of the course "Differential Equations in Partial Derivatives" intended for the formation of techniques for the formation of research and development activities for students;
3. Preparation of methods of forming the search and research activities of future specialists in the course "Differential Equations in Partial Derivatives" and verification on the basis of pedagogical experiment.

Justification and evidence of the research results: they are provided with scientific and pedagogical substantiations of research works, the use of method-methods obtained in accordance with the course of research, the plan for organizing experimental work, the conclusion of primary and final results obtained in accordance with the objectives of the research, research activity of students.

Research Base: International Kazakh-Turkish University named after Khoja Ahmed Yasavi

Publications based on research results: Results, materials and relevant problems are investigated by this work: Conference "Actual problems of modern mathematics, computer science and mechanics - II" (Almaty, 2011), Conference "Modern mathematical problems" (43rd All-Russian) "Youth conference-conference" (Yekaterinburg 2012), Second International Conference on Youth Studies "Mathematical (Terskol - 2012), International Conference on Znanstvena misel journal (Slovenia - 2018), International Scientific Conference "Functional Analysis and its Applications" (Astana, 2012), V International Scientific and Practical Conference "Actual (Turkestan-2017), International Scientific and Practical Conference "Amanzholov Readings-2017" (Ust-Kamenogorsk, 2017),

dedicated to the 65th anniversary of VKMU "The formation of a new paradigm of consciousness: the preservation of the past , the construction of the future ", Bulletin of Karaganda University (Karaganda, 2011), Problems of differential equations, analysis and algebra (Aktobe, 2012), Bulletin of Karaganda State University (Karaganda 2012), Bulletin of Eurasian National University. L.N. Gumilev (Astana, 2012), Mathematical Journal (Almaty, 2012), "Science and Life of Kazakhstan" international scientific journal (Astana, 2017), Bulletin of the Kazakh National Pedagogical University named after Abay (Almaty-2017), Boundary problems, OPEN JOURNAL SPRINGER, IMPACT FACTOR 0.84, International Conference on Analysis and Applied Mathematics (ICAAM 2014) (Shymkent, Kazakhstan, 2014), Eurasia Journal of Mathematics, Science and Technology, SPRINGER OPEN JOURNAL, IMPACT FACTOR 0.903 (October, Turkey 2017).

In 2010-2018, the principles, practical results and conclusions of this work were published in international, republican scientific theoretical and scientific-practical conferences, including: 10 international, including 6 republican and 4 foreign scientific-practical conferences, 7 publications in journals recommended by the committees on control in the sphere of education and science of the Ministry of Education and Science of the Republic of Kazakhstan, 2 articles in the journal from the Thomson Reuters database (ISI Web of Knowledge, Thomson Reuters) and Scopus.

Structure and content of the dissertation: The thesis consists of normative references, definitions, introductions, two sections, conclusions and conclusions, a list of sources used, and applications.

In the introduction, the relevance of the study is substantiated, the objectives of the research, its object, prospects and tasks are formulated, methods are described, scientific novelty and practical significance, basic provisions to be defended, etc., are briefly summarized in the thesis.

In the first section, the pedagogical and psychological foundations of student search and research activities were identified and the methods of students' search and research activities were determined. The peculiarities of teaching the course "Differential Equations in Partial Derivatives" are considered when forming research activities of students of higher educational institutions.

In the second section, the course "Differential Equations in Partial Derivatives" was organized for the formation of research activities of students. It was noted that the effectiveness of the developed methodology was organized and tested experimentally.

In conclusion, the main results of the study, as well as conclusions on their application in future studies in the field of methods of teaching mathematical disciplines in higher education institutions are presented.