ABSTRACT

of the dissertation on them "Methodology of formation of research activity of future biology teachers" of Amanbayeva Makhabbat Batyrgalikizi for a degree of Doctor of Philosophy by the specialty 6D011300 - Biology

Rationale of the research. In his annual messages to the nation of Kazakhstan the President of the Republic of Kazakhstan Nursultan Nazarbayev places emphasis on improvement of quality of education, promotion of knowledge and skills of the young generation.

This idea rests on such key state programs of the Republic of Kazakhstan as Strategic Development Plan 'Kazakhstan 2050' stating that 'The youth of our country must get present knowledge and new skills, apply achievements of science and technology in their everyday life.' This strategic plan also highlights that for these purposes, all conditions must be created and specified tasks must be assigned with an aim to join top 30 developed nations of the world.

This has conditioned adoption of a number of regulatory documents: Message of the President of the Republic of Kazakhstan Nursultan Nazarbayev to the people of Kazakhstan 'Kazakhstan in a new global reality: growth, reforms, development,' nation's plan '100 specific steps: modern state for everyone' efficient implementation of which depend on an availability of highly qualified human resources able to prepare a competitive educational system.

As it follows from the above-stated, present-day education must be formed in compliance with selected directions and strategic development of the model of innovative development of the country and requirement of competitive edges of the leading nations of the world which meets requirements of training of a new format teacher able to swiftly adapt to contemporary changes, prepared for independent creative activities.

Present-day specialist in the field of education must act not only as a translator of knowledge but also as a carrier of pedagogical culture. Students need to learn not to merely reproduce acquired knowledge and methods of action but they need to know how to apply them on their own in new conditions, to transmit acquired knowledge to solution of new learning and practical tasks. That is research activities which generate in students a need to deepen and to update their knowledge which further will lead to functional literacy and professional competence.

Critical need of an evolving general education school for pedagogics of new type able to creatively work in new social and economic conditions, to find solution of various pedagogical challenges is pointed out in works of lot of foreign scholars: D. Berlyne, S.Eugene, G.A.Bordovskiy. M.A.Belyalova, V.P.Bespalko, B.S.Gershunskiy, V.I.Zagvyazinskiy, etc.; local scholars: K.B.Seytaliyev, A.S.Imangaliyev, K.M.Aryngazin, S.Zh.Praliyev, A.K.Kussaiynov, R.M.Koyanbayev, A.M.Mukhanbetzhanova, A.Kh.Arenova, Sh.Kh.Kurmanalina, T.S.Sadykov, A.P.Seyteshov, G.A.Umanov, N.D.Khmel, A.Ye.Abylkassymova,

Sh.T.Taubayeva, Z.A.Issayeva, A.Sh.Baytokayeva, G.K.Baymukasheva, M.A.Uteshova, etc.; within learning of disciplines of biological cycle: V.P.Solomin, S.V.Sumatokhin, N.D.Andreyeva, V.B.Danilevskaya and local biologists: K.A.Aimaganbetova, K.Kaiym, N.Tormanov, Zh.B.Childibayev, K.Zhunussova, R.Alimkulova, K.A.Zhumagulova, S.Ye.Kuanysheva, Zh.T.Abdurassulova.

However, despite such dynamic research and development of the problem of our interest, one cannot judge about implementation of a system approach to its solution in conditions of the three-level system of education since this covers only separate aspects of formation of future teachers of skills of an investigative nature. Study of a status of problem within training of future biology teachers for research activities has allowed us to reveal a number of significant controversies that arose between:

- a need of present-day educational establishments (school, college, higher education establishments) for a researching teacher and a poor development of theoretical and methodological fundamentals of formation in future biology teachers of skills of investigative nature;
- qualification requirements that determine readiness of a teacher for researching activities as a professionally significant norm fixed in a standard of higher vocational education and non-compliance of the existing programs of subject and vocational training of pedagogical staff;
- availability of a high researching potential which biology-related subjects have and the accumulated mass experience of reproductive education and also failure to provide ad hoc methodological tools.

The specified contradictions are interrelated and they can be settled through development of a special methodology for training of future biology teachers where one of key tasks will be formation of research activities (by the example of researching specific features of life of insects (Insecta)). That is how urgency is determined with respect to the problem that we are dealing with which is connected with substantiation and development of theoretical and methodological fundamentals of formation in students of skills of investigative nature (by the example of researching specific features of life of insects (Insecta)). Urgency of the chosen research topic is determined by requirements of a social order from the society to train specialists in biology. All these have conditioned selection of the title of the thesis research: **‘Methodology of formation of research activity of future biology teachers’.**

Objective of the study: theoretical substantiation, development and experimental examination of the methodology of formation of research activities of future biology teachers by the example of researching specific features of life of insects (Insecta).

Object of the study: process of training of future biology teachers.

Subject of the study: methodology of formation of research activities of future biology teachers.

Tasks of the study:

- to determine scientific and theoretical fundamentals of formation of research activities of future biology teachers;

- to develop a structurally conceptual model of a methodological system of formation of research activities of future biology teachers;

- to determine content and to develop a methodology of formation of research activities of future biology teachers by the example of researching specific features of life of insects (Insecta);

- to experimentally verify efficiency of methodology of development of research activities, to introduce it in an educational process.

Keynote: methodology of formation of research activities of future biology teachers must be carried out within the developed model which rests on those necessary and relevant components and criteria which will facilitate formation of investigative skills that determine a structure of personality of future biology teachers that favorably distinguishes him on the present-day labor market.

Methodological and theoretical basis of the study included: theoretical bases of formation of research activities; philosophical ideas about integrity of the environment and cognizability of live nature; scientific and methodological theories in the field of methodology of teaching biology.

Methods of study:

- theoretical (analysis and synthesis research, abstracting and summary, simulation and designing);

- empirical (observation, pedagogical experiment, conversation, interviewing, polling, conduct of control tests, pedagogical experiment, confirming and teaching experiments);

- entomological (field training and laboratory studies of specific features of structure and life of insects);

- statistical (mathematical and entomological processing of research results).

Scientific novelty and theoretical significance of the study:

- scientific and theoretical fundamentals of formation of research activities of future biology teachers have been developed;

- structurally conceptual model of formation of research activities of future biology teachers has been developed;

- methodology has been developed and contents of formation of research activities of future biology teachers by the example of researching specific features of life of insects (Insecta) have been determined;

- efficiency of methodology of formation of research activities has been experimentally verified and introduced into the educational process.

Practical implications: theoretical provisions and conclusions contained in the study create opportunities to update content of education in the form of creation:

- of a new elective course ‘Fundamentals of development of entomological research activities’;

- within examination of specific features of life of insects (Insecta), 8 species from three families of order of hemipterous (Heteroptera) insects were defined and

entered into the list of invertebrate animals for the first time on the territory of state national natural park Altyn-Emel;

- tutorial and resource book ‘Gylym zhetistikteri - biologiyalyk bilim beru kenistiginde’.

These materials can be used in general education secondary vocational establishments, in the system of secondary and higher pedagogical education and also for courses of advanced training for teachers.

Conceptual issues for defense:

- scientific and theoretical bases for formation of research activities of future biology teachers;

- formation of research activities of future biology teachers is carried out step-by-step (determination, explanation and formation) in compliance with a model that includes the following components: objective, conceptual, activity and result oriented;

- methodological conditions of formation of research activities of future biology teachers include theoretical and methodological bases of formation of research skills; combination of class and out-of-class methods of researches, individual and group types of organization of activities of students; broad use of an educational potential of nature by the example of insects that stimulates development in students of interest and needs for research activities;

- results of experiments that prove efficiency of the methodology of formation of research activities of future specialists in biology confirms reliability of statements presented for defense.

Approbation and introduction of conceptual issues and results of the study.

17 papers were published between 2013 and 2016 covering main conclusions and results of the thesis research, these include 4 in scientific publications recommended by the Committee for Monitoring in Education and Science; 1 in a scientific publication include in Scopus database; 10 in materials of an international scientific and practical conference, including 4 in materials of foreign conferences; 1 in materials of the Republican round-table discussion; 1 in a foreign scientific publication.

Reports have been made in a number of international scientific and practical conferences: II international scientific and practical conference ‘Ecological education and ecological culture of the population’ (Prague, 2014), ‘Geographical challenges of tourism, regional studies and ecology’ (Almaty, 2014), ‘Specially protected natural territories and biodiversities’ (Almaty, 2015), ‘Biological and ecological education in secondary and higher school: condition, challenges and prospects of development’ (Saint Petersburg**,** 2014), international scientific and practical on-line conference ‘Present-day pressing challenges in natural sciences’ (Aktobe, 2014), ‘Pressing challenges and results of examination in the field of biological and ecological education’ (Saint Petersburg, 2015), ‘System modernization of pedagogical education of the Republic of Kazakhstan: challenges, ways out’ (Almaty, 2016), ‘Pressing challenges of biological and

ecological education in secondary and higher school: innovation and experience' (Almaty, 2016).

Practical introduction of study results was made within development, approbation and introduction of elective course 'Fundamentals of development of entomological research activities' for students majoring in 5B011300 – Biology.

Structure and content of the thesis research: structure of the thesis research appears from tasks of the study, practical implications of tasks of the research, presentation of material and logics of exploring the research issue. The thesis research consists of introduction, two sections (20 tables, 11 figures), conclusion, list of references covering 185 sources in the Kazakh, Russian and English languages, and an annex.