ANNOTATION

for the dissertation of Gulden Kalioldanovna Yespolova on the topic "Forming the research competence of primary school pupils in the content of renewed education", written for the degree of Doctor of Philosophy (PhD) in the specialty 6D010200 – "Pedagogy and methodology of primary education"

Relevance of research. Today, in view of great changes in the development of society and in accordance with new requirements, the education system faces the task of forming an individual with advanced critical thinking, capable of not simply reproducing existing knowledge and skills, but able to come up with new ideas and acquire knowledge, and apply them in accordance with life circumstances.

The section "Requirements for the content of education" of the state compulsory standard of primary education of the Republic of Kazakhstan notes that the purpose of primary education is to create educational space conducive to harmonious development of an individual and acquiring the fundamentals of a broad spectrum of skills, among which is the ability of primary school students to conduct research work.

Involvement of primary school students in research work to form research competence, development of research skills and independence of thought, increase of cognitive interest, are the actions implemented to solve the abovementioned problem. Implementation of such measures is expected to help in achieving the main objective of educating competent and socially oriented young generation.

In the age of scientific and technological advancements, socially minded citizens with highly developed research skills, with good knowledge in different areas of life, capable of finding new ways and means in solving problems, is formed during the educational process in primary school. Therefore, it is necessary to guide students towards acquiring knowledge, independent research, and development of research skills. Formation and development of research activity is reflected in students ability to apply knowledge and skills related to new situations, to consider familiar objects and circumstances from another point of view, to come up with and try different effective methods of problem solving together with the known ones. Research skills and abilities are vital for scientists, as well as other individuals involved in variety of professional activities. Hence, preparing a child for research activities, development his/her research skills and competencies is an important task of modern education.

Theory of competence formation in the works of such scientists as J. Raven, E.B. Zhalolov, Westera W, HoraţiuCatalano, Cristina Catalano, A.V. Khutorskoy, A.K. Markov, I.A. Zimnyaya, V.A. Bolotov, S.E. Shishov, A.I. Subetto, A.I. Savenkov, T. Durand and others is considered in various aspects.

Theoretical and practical aspects of competence formation were studied by such Kazakhstani scientists as K.S. Kudaybergenova, A.M. Mukhanbetzhanova, G.Zh. Menlibekova, G.Zh. Jadrina, D.T. Kanlybayeva, Sh.Kh. Kurmanalina, A.A. Beisenbayeva and others.

Problems of academic activity on the ground of formation and development of creative and research activities are considered in the works of scientists A.S. Amirova, U.B. Zhexenbayeva, S.S. Izmukhanbetova, A.Y. Abylkassymova, Sh. Taubayeva,

M.A. Uteshova, Z.A. Issayeva, M.B. Amanbayeva, N.T. Sartayeva, U.B. Akhatayeva, A.N. Savenkov, A.V. Leontovich, A.S. Obukhov, A.N. Poddyakov, Zh.V. Rasskazova, L.A. Kazarina, N.A. Semenova, Burton R. Clark, D. Berlyne, A. Yildirim, V.G.Ryndak, J.C. Clark et al.

Analysis of scientific and pedagogical research on the problem has revealed new directions for students' competence formation during research activities. However, analysis of the current learning process indicates a low level of organization of students research activities and a lack of the ability to conduct research independently.

Analysis of the abovementioned scientific and pedagogical works and literature showed that although they addressed the issues of primary school pupils research activities and the issues of primary school students research competence in the context of the renewed education content, the problem remains poorly explored. It has been established that there are contradictions between the requirements of the modern pedagogical paradigm, which gives priority to primary school students research competence formation in accordance with demands of modern society, and orientation of teachers towards developing knowledge and skills of students; between the need to develop research competence of primary school students within the updated educational program and insufficiently substantiated special methodological system and practical relations to achieve this objective and solve the necessary problems. Studying solutions of these contradictions became the main reason for choosing the topic of our thesis work "Forming the research competence of primary school pupils in the content of renewed education".

Purpose of research: to give scientific and theoretical substantiation of forming research competence of primary school pupils in the subject of Natural Science within the framework of renewed content of education, to propose methodology, to prove its effectiveness through experimental work.

Object of research: pedagogical process of primary school within the renewed content of education.

Subject of research: forming of research competence of primary school pupils in the subject of Natural Science.

Main objectives of research:

1. To give scientific and theoretical substantiation of forming research competence of primary school pupils.
2. To define the characteristics of formation the research competence in the academic and cognitive activity of students on the basis of the subject of Natural Science in primary school.
3. Concretise the concepts of "research", "competence", "research competence".
4. To develop a structural and conceptual model of forming research competence of primary school students within the renewed content of education.
5. To develop the educational and methodological complex for formation of research competence of primary school students in the content of renewed education and check its effectiveness by conducting an experiment.

Research hypothesis: ***if*** the theoretical and methodological foundations for formation of the research competence of primary school students are determined, the structural-content model and methodology are developed and introduced into the educational process of primary school, ***then*** the effectiveness of formation of research

competence in the academic and cognitive activities of students in the Natural Science will increase, ***since*** specially conducted experimental work will help students learn to conduct research themselves and achieve the results, so that the content of education will be qualitatively mastered and their creative abilities will be developed.

Research methods:

- theoretical (analysis, comparison of scientific and theoretical literature, result design);

- empirical (survey, interview, observation, analysis of educational and methodological documentation, analysis of independent research work of primary school students, testing, practical work, methods of quantitative and qualitative analysis of research results).

Research basis: experimental work was carried out at PSE "Secondary School No. 15", PSE "Secondary School No. 1 named after Shakarim", PSE "Secondary School No. 16 named after Zaka Akhmetov", PSE "Secondary School No. 46" of the Department of Education of Ust- Kamenogorsk of Administration of Education of the East-Kazakhstan Region; carried out for students of 2-4grades, 345 students in total. 172 students are the experimental group, 173 students are the control group. Class teachers of the students participated in the study; 32 primary school teachers in total (15 of them are the experimental group, and 17 are the control group).

Main idea of research: academic and cognitive, scientific and research activities of students, aimed at research, in implementation of the renewed content of primary education, is not only their own achievement of their personal quality in the search, creative plan, but also provides effectiveness of formation of research competence of the student in independent learning of new knowledge.

Methodological and theoretical foundations of research: philosophical, pedagogical and psychological concepts of personality development during activities; scientific concepts of forming research competence of primary school pupils.

Sources of research: works of philosophers, educators, psychologists; documents presented by the Ministry of Education and Science of the Republic of Kazakhstan on the updated education content or primary schools (concepts, educational programs, textbooks and teaching aids); consideration of the best teaching experience on research competence formation, as well as educational and scientific experience of the author.

Research was conducted in three stages

At the first stage (2018-2019) the relevance of the research was determined, the analysis of philosophical, pedagogical and psychological literature was carried out; the purpose, objectives, object, subject of research were defined, the scientific and theoretical basis of the research was considered, the scientific apparatus was developed.

At the second stage (2019-2020), the structural and content model of formation of students' research competence was developed through their research activities. Stages of "research lessons", which involve primary school students in research activities, were compiled. The program of the special course "Young Researcher"was developed to increase the effectiveness of psychological and pedagogical research work.

At the third stage (2020-2021) the practice of formation was completed, the hypothesis of research and effectiveness of the conducted work were verified on the

basis of the results analysis, scientific and methodological recommendations for research competence development through students research activities were processed, work on the thesis was completed.

Scientific novelty and theoretical significance of the research:

1. Primary school pupils research competence formation is theoretically substantiated.

2. The characteristics of formation of research competence of primary school students in the renewed content of education are defined.

3. The concepts "research", "competence", "research competence" are concretized .

4. Structural and conceptual model for primary school pupils research competence formation in the subject of natural sciences is developed.

4. Methods and techniques of primary school pupils research competence formation in the subject of Natural Science within the renewed content of education are considered.

5. The educational and methodological complex for formation of research competence of primary school students in the renewed content of education is developed and its effectiveness was tested through an experimental experiment.

Practical significance of research work: As a result of our research work, the educational and methodological complex is drawn up on formation of research competence of students in the organization of the pedagogical process at the stage of primary education, consisting of the special program "Young Researcher", a workbook for students of grades 2-4 " I learn to create a project". In addition, the methodology is developed. The research results can be used in the course of the educational process in universities, specialized vocational pedagogical educational institutions, secondary schools, centers for training students in their specialty and in the courses of the Institute for advanced training.

Provisions for defense:

1. The process of formation the research competence of students at the stage of primary education is constantly considered in science as a psychological and pedagogical problem. Theoretical, methodological and methodological approaches to the research and competence of students in the framework of the studied subjects in primary school to involve students in the research are analyzed, and new recommendations are given. The research carried out before us, forms the theoretical basis of our research work.

2. Formation of research competence of primary school students in implementation of educational, cognitive and scientific and research activities is perceived as an indicator of the quality of a new type student who has mastered the skills and abilities necessary to search for new information data and sources, using methods and techniques of independent research, improving logical thinking, imagination, planning a new object of research and considering the ways of studying it.

3. Research competence is one of the priority areas for improving education at the present stage of primary education. The combination of theory and practice of primary education is manifested by students in the educational, cognitive and research activities, the ability to navigate in their capabilities in accordance with life

requirements, to concretize their purpose, the ability to formulate thoughts. The essence and characteristics of the concretized concepts of “research”, “competence”, “research competence” from a psychological and pedagogical point of view constitute the theoretical basis of our research work.

4. Content analysis of scientific-theoretical and scientific-methodological literature on formation of research competence of primary school students, being guided in the research activities of students by the approaches and definitions of positions, principles, methods, components, became the basis for creating the structural and content model. The criteria and components of formation of research competence of primary school students show the basic structure in which they are closely interconnected.

5. In the course of conducting experimental work on formation of research competence of primary school students, the educational and methodological complex was introduced into the educational process of primary school, consisting of a program in the subject of natural science “Young Researcher”, within which the workbook “Learning to write a project” for 2-4 grades primary school students was compiled

Approbation and implementation of the research results:

The main conclusions, theoretical and practical results of the research were discussed at international conferences and in scientific publications. During the research 15 papers were published. Including 2 publications in the Scopus database, 5 articles in scientific journals recommended by the Committee for Quality Assurance in Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan, 7 articles in the proceedings of international scientific conferences, 1 workbook “Learning to write a project”:

1. Research competence of students as the component of content of education (Scopus) //Opcion - 2019. - V.35. - Iss. 88. - P. 948-961. /ISSN: 1012-1587/ ISSNe 2477-9385

2. Formation of Research Skills at Younger Schoolchildren: Experience of Kazakhstan (Scopus) //Talent Development & Excellence Vol.12, No.1, 2020, 999-1005

3. Оқушылардың зерттеушілік түсінігін қалыптастыру. //Қазақстанның ғылымы мен өмірі (Халықаралық ғылыми журнал). – Астана 2019. - №1 (74) 2019. – 26-30 б.

4. Learners’ research competence as the component of updated content of primary education. //Абайат. ҚазҰПУ, ХАБАРШЫ «Педагогикағылымдары» сериясы. - №1(65). – 2020. – 315-319 б.

5. «Зерттеушілік құзыреттілік» ұғымының ғылыми конструктісі //Қазақстанның ғылымы мен өмірі (Халықаралық ғылыми журнал). – Астана 2020. - №5 (3) 2020. – 319-323 б.

6. On students’ research activities // Bulletin of Toraigyrov University. Pedagogical series - Pavlodar. - No. 3. - 2020. - 581-590 b. https://doi.org/10.48081/AMTU9445

7. Formation of professional competency of future primary school teachers at university in the context of teaching research activities to primary schoolchildren //

Bulletin of Karaganda University. Series “Pedagogy”. - No. 3 (103) / 2021. - 110-116 pages - DOI 10.31489 / 2021Ped3 / 110-116

8. On primary school pupils research competencies formation within the framework of the updated education content in Kazakhstan. // EUROPEAN RESEARCH: XYIII International Scientific and Practical Conference, Penza: ICSC “Science and Education”. - 2018. - pp. 295-300

9. On formation of primary school pupils research activities // Integracion de las ciencias fundamentales y aplicadas en el paradigma de la sociedad post-industrial: Coleccion de documentos cientificos “ЛОГОЄ” con actas de la Conferencia Internacional Cientifica y Practica (Vol. 4), 24 de abril de 2020. Barcelona, Espana: Plataforma Europea de la Ciencia. 55-58 pp. DOI 10.36074 / 24.04.2020.v4.19. - ISBN 978-84-544-6785-3

10. Importance of formation of primary school pupils research activities // Proceedings of the IX International scientific and practical conference “EKSU, the implementation of the idea of value-oriented education: problems, research, solutions.” - University named after S. Amanzholov. March 2020 - Ust-Kamenogorsk. - pp.399-403.

11. Structural and content characteristics of the “research competence” concept // Specialized and multidisciplinary scientific researches: Collection of scientific papers "ΛΌГОΣ" with Proceedings of the International Scientific and Practical Conference (Vol. 2), December 11, 2020. Amsterdam, The Netherland : European Scientific Platform. - 109-112. DOI 10.36074 / 11.12.2020.v2.31

12. On organization of primary school pupils research activities// INTERNATIONAL SCIENTIFIC JOURNAL GRAIL OF SCIENCE №2-3 - April, 2021 – 505-508 стр. Міжнародний науковий журнал «Грааль науки» | № 2-3 (Квітень, 2021) DOI 10.36074/grail-of-science.02.04.2021.102

13. On formation of primary school pupils subject competence // Theoretical and practical aspects of modern scientific research: Collection of scientific papers "ΛΌГОΣ" with Proceedings of the I International Scientific and Practical Conference (Vol. 2), Seoul, April 30, 2021 Seoul-Vinnytsia: Case Co., Ltd. & European Scientific Platform, 2021. - 79-82 pp. DOI 10.36074 / logos-30.04.2021.v2.25

14. Modern scientific approaches to primary school pupils research competence development // Problemas y perspectivas de la aplicaciyn de la investigaciyncientнficainnovadora 11 de octubre de 2021, Panama, República de Panama 178-181 pp. DOI 10.36074 / logos-11.06.2021. v1.54

15. Workbook “Learning to write a project.” For 2-4grades students. - Taldykorgan: 2021.- 51 p. Copyright certificate. November 12, 2021, No. 21690

Structure of dissertation (thesis work): consists of introduction, two chapters, conclusion, references and appendix, tables and figures are included.

In the introduction, the relevance of the dissertation work is determined and the scientific apparatus of research work is created, that includes: the purpose, objectives of research, subject and object of research, hypothesis of research, the research basis and research stages, scientific novelty of the research and the provisions for defense.

The first section “**Scientific basis for the formation of research competence of primary school pupils**” provides analysis of theoretical works on the problems of research activities, competency, competence, primary school pupils research

competence within the updated education content. In the process of formation of primary school students research activities the concepts of “research actions”, “research activities”, “research activity”, “competency”, “competence”, “research competence”were discussed, which served as the basis for our topic. As a result of independent reflection the concepts of “student’s research competence” were defined. The structural and conceptual model for forming research competence of primary school students was developed.

The second section “**Methods of formation of research competence of primary school pupils in Natural Science in the context of updated content of education**” provides methods and techniques of forming research competence of primary school pupils, considers ways of implementing students research competence in educational and cognitive activities in the subject of natural sciences; developed stages and presented a model of “Research lesson”; developed a special program “Young Researcher” and presented a lesson model; a workbook “Learning to write a project” for 2-4 grades primary school students was compiled. The content of the experimental work aimed at determining forming research competence of primary school pupils in Natural Sciences was disclosed, a comprehensive analysis of the experimental work results as carried out.

In **conclusion** scientific recommendations were given and general conclusions were made based on the experimental work results.

The **appendix** contains materials used in the research, which were not included in the dissertation thesis.

Main part.

The theoretical first part concerning the scientific foundations of forming research competence of primary school pupils provides an analysis of the updated education content, the features of the primary school students research activities in learning and cognitive activities and research competence development, the model is created and system characteristics revealing its structural content are analyzed.

In the pedagogical process carried out within the framework of the updated education content, priority is given to the cognitive work of students, engaging in independent educational activities. Therefore, wide application of innovative approaches is becoming central to the professional activities of teachers. Here students learn the origin and principles of acquiring knowledge and its application in their life. State compulsory standard of primary education indicates that one of the main requirements for the educational process is the necessity to create conditions for organization of students research activities within the framework of compulsory educational program, as well as during extracurricular time.

In our research we reveal the essence of the concept of “students research activity” in the context of the updated education content, as well as the concepts of “research activity”, “research activeness”, “research ethical culture”, “research skills”, “research principles”.

Content and analytical results of the main research activity characteristics.

Table 1. Comprehensive analysis of the definition of research activity

Authors / **Features**	Alexeev N.	Vikol B.	Dalinger V.	Larkina E.	Leontovich A.	Obukhov A.	Savenkov A.	Chechel I.
Creative activity details	+			+	+	+	+	
Acquiring new knowledge	+	+	+	+	+	+	+	+
Research skills development	+		+	+	+	+		
Significance of the process	+	+	+	+	+	+	+	+
Significance of results		+						
Teacher-student interaction								
Problem situation	+		+		+	+	+	+
Teaching	+	+	+		+			
High level of independence	+	+	+		+			
Free choice of means	+	+						
Scientificity	+		+	+	+			

Considering the results of the analysis of definitions it can be concluded that the concept of "research activity" is described by the authors as "part of creative activity"; "acquiring new knowledge"; "research skills development"; "significance of the process"; "significance of results", "teacher-student interaction"; "problem situation"; "teaching"; "high level of independence", "free choice of means", "scientificity".

Relevance of the problem of adequate organization of primary school students research activities in terms of methods of teaching pedagogical, psychological and individual disciplines lies in the fact that modern educational programs, based on public demand, develop students' motivation and independence in learning and cognitive activities, revealing their ability to be creative in solving problems and overcoming difficult situations, as well as acquiring new knowledge, associated with assessment and development.

The domestic and foreign literature devoted to the problem of research activities development gives the following definition of the "research activity" concept:

Table 2. Content analysis of the concept of "research activity" in the works of domestic and foreign scientists

No.	**Authors**	**Definitions**
1	M.A.Uteshova	Research activity is the main teaching method based on the child's natural desire to explore the environment independently.
2	U.B.Zhexenbayeva	Having mentioned that student's research activities, research ethics are complex integrated knowledge that embraces a person, she indicates that a "research teaching methodology" is created on the basis of them. "Research teaching' is the main way of teaching built on motivation the child to learn independently the world around him. Its goal is to form students readiness and ability to master independently, creatively new ways of activity, whatever human culture sphere they are in.

Sequel of table 2

3	M.B. Amanbayeva	Research activities are aimed at identifying novelty in the educational process, establishing connections and relationships, theoretical and experimental argumentation of specific facts, laws identifying.
4	N.Sartayeva	Use of information technology in primary school allows to intensively implement the educational process and organize students' information and educational activities, educational and play activities, experimental and research activities, independent activities as well.
5	Burton R. Clark, 1997	Research is an ideal concept of the relationship between teaching and learning, pointing to research activity which serves as a method and a means of teaching.
6	D. Berlyne	Research activity is the activity aimed at not suppressing motivation from the emergence of unknown.
7	A.V. Leontovich	Speaking of "research activity" as an educational technology, he implies performance by students under the guidance of a specialist of previously unknown educational research tasks, where the content of research tasks is aimed at creating ideas about objects or phenomena of the surrounding world.
8	Yildirim A., Simsek, H 2008	Research activitiy is collecting similar data in the context of certain concepts and topics and interpreting them in an organized manner that is understandable for readers.
9	E.Yu.Nikitina	Activity related to search for answers to creative, research problems, the solution of which is not known in advance.
10	A.N.Poddyakoav	Research activity is an activity aimed at finding new information from the external environment.
11	Clark J.C, 2006	It is very important that the teacher encourages pupils' interest in research activities in the course of the research.
12	V. G. Ryndak, O. V. Saldaeva, 2019)	Use of research methods in teaching is carried out through the relationship between a teacher and a student, a teacher and a younger group, a younger group and a student. Here the teacher plays the role of a moderator. In addition, this interactive learning technology has specific, predictable goals. One of them is creation of conditions under which the learning process will be successful, which will allow the student to realize his educational level in the learning process, to reveal his intellectual abilities.
13	A.I.Savenkov	The research is aimed at formation of skills, namely: the ability to see the problem, the ability to predict, observe, the ability to work with books and other sources of information, the ability to conduct experiments, the ability to define concepts.
14	J.Raven	The research activity of students is defined as a creative process of joint activity of two subjects in search of the solution to the unknown, during which the transfer of cultural values is carried out, as a result of which a worldview is formed.
15	Bakhtin 1979	Research activity provides a dialogue in the activities of students and teachers: mutual understanding and cooperation with other people through joint creative work and collective reflection.
16	A.S.Obukhov	"Encouraging students to learn the world and themselves in this world", that is he defines the research activity of students as a process of joint creativity of a teacher and a student in search of a solution to the unknown, during which cultural values are transferred between each other, as a result of which a worldview is formed.
17	A.S.Chikisheva	Research activity of a scientific nature, which is aimed at explaining phenomena, processes, establishing connections and relationships between them, theoretical and experimental substantiation of facts, identifying laws using scientific methods of learning, as a result of which the subjective character acquires personal significance.
18	A.V.Khutorskoy	Research activity is a "scientific activity of students" ... "the signs of academic activity: it is carried out by the subject of the activity on the basis of his personal educational capabilities, individual characteristics, motives and goals; it creates subjective difficulties and problems in the activity of the subject due to insufficient assimilation of methods, means and other conditions necessary for implementation of the research; it leads to creation of a new educational product for the subject, corresponding to the type of performed activity.

Considering the works of scientists, during contextual analysis of the concepts of "research actions", "research activities", we come to the conclusion that the preliminary results of the "research activity" are unknown, but we were convinced that it is connected with consideration of methods of solving research problems on the basis of research and creative work and seeking accurate answers. Thus, an activity can be imagined as a set of systematic actions that should be mastered by a student, consisting of individual and general research abilities, and which are repeated several times during work as needed.

Domestic scientists have summarized the following ideas about competency and competence. Competency is readiness to effectively use internal and external resources to achieve goals; preparation for successful actions to meet personal and social needs, creates a social order in the education system.

In the Foreign languages dictionary, "competence" means gaining knowledge that allows you to express thoughts about something and show an authoritative and balanced opinion.

Based on the above studies, a content analysis of the comparative definitions of such concepts as "competency" and "competence" was carried out.

Table 3. Definitions of the content analysis of the concepts of "ability" and "competence"

Scientists	Competency	Competence
M.Zh.Djadrina	Personal capabilities of an official, his qualifications (knowledge and experience), allowing him to take part in decision-making or independently resolve issues through the existing certain knowledge and skills.	Differs in solving problems by students through self-development, self-management, using knowledge, abilities, skills in a narrow circle.
A.V.Khutorskoy	A set of interrelated personality traits (knowledge, abilities, skills, ways of activity) that relate to a certain range of things or processes and are necessary for qualitatively productive activity in relation to them.	Acquisition by a person of relevant competencies, where his personal attitude integrates to the competency and the subject of action.
G.K.Seevko	Competency is the result of education, which is expressed in the preparation of the graduate, in real mastery of methods, techniques of activity, in possibilities of solving specific problems, in the form of combination of knowledge, skills, abilities that allow to achieve the goals of transforming the environment.	Competence is an integral quality of a person expressed in general ability and readiness of a person for activity, it is based on knowledge and experience accumulated in the process of learning and socialization, and it is aimed at independent and successful participation in activities.
I.A.Zimnyaya	Competency a set of components of the content of education, whose development in the learning process allows you to carry out productively practical activities.	Competence is an topical, forming personal quality that is based on knowledge, which manifests itself not only in the appropriate solution of standard and non-standard tasks in practical activity, but also in social behavior and human actions.

If we pay attention to the content of the definitions of “competency” and “competence”, then it is considered as a set of separate interrelated qualities in the form of combination of knowledge, skills and abilities necessary for students to be able to cope with different educational tasks, as well as to perform purposeful activities.

Therefore, in our research, we built our own model, focused on the problem of “forming the research competence of primary school pupils” within the framework of the updated educational content, and we are convinced that this model works in practice, that is in the real pedagogical process. Our model for formation of the research competence of primary school pupils was implemented by a system of teaching materials based on the subject of natural science in primary school. The model presents the content structure of formation the research competence of primary school pupils as “personal-motivational”, “cognitive”, “activity”, provides the forms, indicators and the didactic structure of students’ development of research activities. It also shows the relationship between the processes of pedagogical guidance of a primary school teacher, aimed at solving the problem of developing a student’s research competence and the student’s mastery of research activities.

The second section “Methods of formation of research competence of primary school pupils in Natural Science in the context of updated content of education” considers methods and techniques for formation of the research competence of pupils and the results of experimental work aimed at identifying the ways to implement the research competence of pupils in educational and cognitive activities and their research competence formation in educational and cognitive activities in Natural Science.

The content of the subject “World cognition”, studied at the level of primary education, was changed. The basis of the subject “World cognition”, studied in primary school at the present stage, was formed by the subjects “History”, “Geography” and “Social Studies”, which contribute to formation of historical, geographical and social understanding of the processes taking place in the surrounding world; and from the 1st grade, the subject “Natural Science” of updated content was introduced in all schools, which is the initial course for studying the subjects “Biology”, “Physics” and “Chemistry”, as well as forming the foundations of research skills important for any field of knowledge.

Research lessons contribute to development of research and cognitive activities of younger students and acquisition of important research skills. Inductive and deductive forms of research, consisting of individual and team work, are carried out at different stages of the research lesson.

Research work of students is an integral part of the educational process in a comprehensive school.

In the organization of research work with students, the following directions can be distinguished:

- conducting classes, research work with students in the educational process, research work of the research nature;
- organizational and mass events (Olympiads, scientific and practical conferences, etc.);
- extracurricular research work.

An indicator of the success of the research activity is that it is associated with the qualities manifested in the personality of an individual student: enthusiasm, initiative, interest in solving personal, research problems, developed intellectual abilities, mastery and ability to distinguish between methods of cognition, to set clear goals, to build consistency and systematicity of the organized and performed work in solving problems, as well as to carry out their implementation, attention and observation. It is implied that intellectual abilities corresponding to the age and grade characteristics of the student allow to find the solutions to search and creative, non-standard problems, to create feedback regarding the achieved results.

When considering and understanding the problem of formation of research competence of pupils, first of all, it is necessary to proceed from the fact that the object under study is valuable and this should be the basis for the need to form a subject-worldview position of students' competence. Only then he switches to active activity and in the activity of the educational and cognitive process the ability for personal organization through self-determination, feedback with its results, self-control and the ability to independently regulate this process is manifested.

The experimental work of this dissertation research was carried out at PSE "Secondary School No. 15", PSE "Secondary School No. 1 named after Shakarim", PSE "Secondary School No. 16 named after Zaka Akhmetov", PSE "Secondary School No. 46" of the Department of Education of Ust- Kamenogorsk East Kazakhstan Region. In total, 345 students, 32 primary school teachers took part in the experimental work (15 of them were the expert group, and 17 were the teachers of the control group). 172 students took part in the experimental group, 173 students in the control group.

The purpose of the experimental work: to identify the level of research competence of primary school pupils in the updated content of education, to form it using the proposed methodology and to check the effectiveness using mathematical statistical methods.

The experimental work consisted of 3 stages:

In the defining experiment, the initial (low, medium, high) levels of development of the research competence of primary school students were identified. For this, the following work was carried out to identify personality-motivational, cognitive, activity structures:

During the survey, to the question "From what grade it is advisable to start the development of research competence among students in the subject Natural Science", teachers, expressing their point of view, believe that development of research competence should start from grades 1-4, since particularly ay this stage the basis of the basic requirements is laid that students should complete before grade 11.

Summarizing the results of the pedagogical experience obtained from surveys, observations, generalization of pedagogical experience, analysis of the work of teachers in Natural Science, it was found out that teachers have incomplete theoretical and methodological knowledge in the field of cognitive activity, which in turn indicates the reason for low research competence of students.

Thus, the analysis of the updated content of education revealed the need to form its personal-motivational, cognitive, activity structures for formation of research competence of primary school pupils. The results of the study, based on the

experience of teachers, showed that the task of forming the research competence of pupils through personal-motivational, cognitive, activity structures is not always realized in every lesson. Summing up, we would like to say that many years of experience and study of new sources of information, as well as the results of our research experiment prove that the process of forming pupils' research competence should be integrated.

We conducted a formative experiment of forming the research competence of primary school pupils in the context of updated education using our proposed methodology.

Table 4 – Performed work, methods, techniques and forms used to form each structure of research competence of primary school students on the updated content of education in a formative experiment

Structure	Performed work	Methods and techniques	Forms
Personal-motivational	- Competitions; - Contest "Best Project".	- Problem-based teaching; - Project method; - Control; - Forecasting method; -Give a definition of concepts; Explanatory and illustrative method; - - Problem method; - Research method; - "Clock Buddies" or the method of making an appointment with four students; Team building method; - Same but different method; - Method of "graphic reading"; - Philford method; - Strategy of "direct radio broadcast"; - "intellectual goal" game; - Critical thinking; - "Boomerang" technique; - "Correct and incorrect conclusions " or " Do you believe "; - "Cluster" technique; - "Insert" technique; - Thin and thick questions; - "Sinkwine" technique; - Comparative approach.	Classroom and extracurricular forms of education: -Lesson-research; - Olympics; - Circle work; - Subject weeks, decades, months; - Excursion; - Contest; - Exhibitions; - Cognitive (museum, library); - Museum; - Collecting
Cognitive	- "Young researcher" club; - A memo on organization research activities of primary school students.		
Activity	- Workbook "I learn to create a project"; - Development of projects in Natural Science subject.		

Formation of the research competence of pupils was carried out using the methods and techniques described in subsections 2.1, 2.2 of section 2, in classroom and extracurricular education forms, the "Young Researcher" club and a workbook for grades 2,3,4, etc.

When forming the cognitive structure of the research competence of primary school pupils, we used the "Memo on organization of research activities with younger students", developed for grades 2-4. This guidance provided students with complete

information on how to conduct the research. It is always in front of the students and it helps to remember if they forget something. We explained how to work with this memo until they got used to working from it.

Summing up, we would like to note that in the course of the dissertation work, the theoretical analysis has been carried out, and the methods and experience of pedagogy in formation of research competence in the modern system of primary education based on the system of methodological foundations and the originality of the organization of research activities of students have been analyzed and considered comprehensively from the point of view of the philosophy of education.

Summarizing our dissertation research, we draw the following conclusions:

1. On the research topic of the dissertation, the scientific works of domestic and foreign scientists devoted to the special study on this issue were comparatively analyzed and considered, the possibilities of the scientific-theoretical and practical systems for formation of research competence of pupils by organizing their research activities in accordance with age characteristics in modern conditions of our updated primary education were disclosed and grounded.

2. The characteristics of formation of research competence of primary school students were determined from the theoretical point of view based on the analysis of psychological and pedagogical scientific works. Analysis of the research on formation of research competence of primary school students points out that organization of educational and cognitive and scientific and cognitive research activities should be based on these characteristics.

3. As a result of the comprehensive and systematic study, the essence and structure of the concepts “research”, “competence”, “research competence” in scientific works on the basis of their concretization are revealed. The concept of “research competence” is considered as the result of search and creative activity, characterized by a sufficient level of mental development of the individual and carried out in the process of implementing training, educational and cognitive and scientific and cognitive research activities.

4. The structural and content model of formation of research competence of primary school students was developed, based on systematic, personality-oriented, activity-based, competency-based approaches, in the form of requirements for students in relation to their self-organization and implementation, guided by the principles of developmental education, science, life connection with practice, consistency and consistency, problematicity, subjectivity, self-organization of research activities. On the basis of the proposed model, the content of the personal-motivational, cognitive, activity components in interconnection and interdependence of the process of forming the research competence of primary school students was determined.

5. Conducting with the help of the experiment on checking the effectiveness of formation of research competence of primary school students. Experimental work was carried out in PSE “Secondary School No. 15”, PSE “Secondary School No. 1 named after Shakarim”, PSE “Secondary School No. 16 named after Zaka Akhmetov”, PSE “Secondary School No. 46” of the Department of Education of Ust- Kamenogorsk city of East Kazakhstan Region, which made it possible to form the research competence of primary school students using the system that includes a program and

tasks developed in the subject of Natural Science for primary school students in natural cognitive and scientific research. The level of indicators in the experimental group, obtained during the formative experiment, was significantly higher than in the ascertaining period. The carried out mathematical and statistical processing showed the accuracy of the results obtained, which indicates effectiveness of our methodological support. The effectiveness of the experimental work showed that the methodology for formation of the research competence of primary school students turned out to be quite efficient, the hypothesis put forward proved its correctness.

Based on the results of the study, the following recommendations are made:

- to organize special seminars, webinars with teachers on formation and improvement of the research competence of primary school students;

- to conduct targeted training of teachers in mastering the method of effective use of Internet platforms, digital technologies for organization of educational, cognitive and research activities to form the research competence of primary school students;

We believe that the results of our research may serve as a basis for improving work on the problem of primary level of secondary school, and for conducting new research work in this direction.

Since the research problem is complex, it is impossible to cover sufficiently all its areas, therefore it cannot be said that the problem under consideration has been completely solved. We think that it is necessary to consider further the formation of research competence of primary school students in close relationship with practice, and the organization of research activities of primary school students in the context of continuity with the main link.