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Development of Research Skills in Primary School Students

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Abstract. The article provides an in-depth discussion of the issue of developing research skills in younger schoolchildren within an informational educational environment. It is noted that through the formation of research competencies, primary school students enhance their critical thinking, analytical abilities, and problem-solving skills. With the support of teachers, they participate in scientific projects, conduct experiments, and learn methods for independently seeking information. This process is said to increase their interest in acquiring new knowledge and contributes to the development of their intellectual and creative potential. The cultivation of curiosity, creativity, and a drive for novelty is considered crucial for the personal development of young learners, thereby fostering their cognitive interests and stimulating active learning.

The article also examines the concepts of inquiry, curiosity, creativity, and the pursuit of discovery, demonstrating that their development is particularly important at the primary school stage. It is shown that the research abilities of young learners are fostered through participation in research projects, conducting experiments, and engaging in independent information-seeking activities.

This research paper addresses issues related to inquiry, research activity, and the development of research skills in students. Research is defined as a cognitive process aimed at generating new knowledge that contributes to understanding cognitive patterns and phenomena. Research activity is considered a specific form of educational work that enables students to carry out creative and investigative tasks with the goal of achieving uncertain outcomes.

Key words: primary school, research skills, informational and educational environment, critical thinking, creativity, educational process, pursuit of innovation.

Introduction

The primary school period is a particularly important stage for the development of students' cognitive activity, the enhancement of their personal interests, and the formation of creative

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abilities. During this period, inquiry, curiosity, creativity, and the pursuit of novelty play a critical role in shaping the child as a personality. The development of research skills in younger students, fostering interest in new knowledge, adapting to independent learning, ensuring continuity in personal education, and cultivating skills characteristic of cognitive activity remain consistently relevant.

It is well recognized that project-based and research activities serve as powerful tools for revealing students' research potential and for fostering their development as well-rounded individuals.

Research activity among primary school students is a creative process aimed at understanding the surrounding world, enabling children to discover new knowledge and methods of action. It creates favorable conditions for the development of their value-based, intellectual, and creative potential, acts as a means of engagement, and stimulates interest in the subject matter. Furthermore, it supports the formation of both subject-specific and general academic skills.

Thus, at the initial stage of education, the issue of enhancing students' cognitive engagement across all phases of educational development remains highly relevant, as such engagement is a prerequisite for the formation of intellectual qualities of the individual.

The Law of the Republic of Kazakhstan "On Education" states: "The primary goal of the education system is to create the necessary conditions for acquiring education aimed at the formation of personality and professional readiness based on national and universal values, scientific achievements, and practical experience; ... the enrichment of intellect through the creation of conditions for personal development; ... the introduction of new educational technologies, the informatization of education, and integration into international global communication networks" [1].

Primary school students can develop their research abilities through participation in research projects, conducting experiments, and engaging in independent information search. The development of cognitive activity in younger learners - as well as their research skills, curiosity, creativity, and pursuit of novelty - supports their personal growth. Through the cultivation of critical thinking skills, analytical abilities, and involvement in scientific projects, experiments, and independent inquiry, students' cognitive interests are enhanced, and they are encouraged toward active learning.

According to scholars, research skills represent a set of competencies that include critical thinking, analytical abilities, and problem-solving in children. The development of these skills can enhance primary school students' interest in science and improve the overall learning process.

From a philosophical perspective, research is considered a form of cognitive activity aimed at acquiring new knowledge. It is characterized by reliability, evidence-based reasoning, objectivity, and reproducibility at both the theoretical and empirical levels.

The scholar V.V. Kraevsky, linking research and research-related problems with pedagogical practice, viewed scientific inquiry as a methodological investigation and as methodological support for research activity within the unity of a knowledge system and a system of actions. He clarified the regularities and principles underlying the development of pedagogical science,

as well as the methods and strategies for improving the quality and effectiveness of educational research [2].

The intellectual and creative potential of primary school students is developed through the implementation of research activities and the enhancement of their research abilities.

In this context, the scholar K.Zh. Buzaubakova outlined the structure of the "learning to learn" model, dividing it into five stages:

Stage 1 – *Encounter with the problem.*

Stage 2 – *Data collection* – verification (confirmation of documentary evidence).

Stage 3 – *Data collection* – experimentation, including the distribution of investigated factors.

Stage 4 – *Explanation:* students articulate and present their own interpretations.

Stage 5 – *Analysis:* reviewing the research process by class, and analyzing the course of the study [3].

One of the scientific methods employed by primary school teachers is the development of research skills in younger students. Through these methods, teachers foster critical thinking, analytical abilities, and problem-solving skills. Moreover, research activity increases students' interest in new knowledge and contributes to the development of their intellectual and creative potential. In this way, it becomes possible to enhance students' cognitive activity and motivate them toward active learning.

The scholar N.T. Sartaeva defined research skills in primary school students as a form of motivation for creative work, characterized by the acquisition of new subjective knowledge based on factual data and evidence, which requires inquiry and active engagement [4]. In the studies conducted by A.M. Tekesbayeva, it is emphasized that enabling primary school students to interact with nature, perceive it through their senses and actions, and become familiar with its fundamental characteristics allows them to observe natural phenomena, recognize interesting elements in their simplest forms, and study local features and seasonal changes in the environment [5].

Based on this, it can be concluded that during research-based activities in natural science lessons, primary school students gain the opportunity to solve problem situations and complex questions, activate their cognitive activity, engage in experimentation, observation, discussion, and complete creative tasks.

According to the scholar S.S. Izmukhanbetova, the development of research activity in primary school students follows a step-by-step structure that includes the following stages:

– Differentiation and enhancement of activities in organizing students' cognitive and research-based learning;

– A high level of interpersonal communication skills, with an emphasis on research-oriented collaboration within cultural relationships involving parents;

– The ability to organize and utilize opportunities for research-based communication both in lessons and in extracurricular activities;

– Designing and establishing the necessary conditions for organizing students' research activity, including the ability to systematize effective approaches in the process of acquiring new information [6].

In the works of G.S. Mailibayeva and A.D. Ansabayeva, it is demonstrated that in order for students to develop their curiosity and investigative capabilities, a foundational interaction between the school and the family must be established to achieve a common goal. In other words, creating favorable conditions for the development and education of younger students should aim at fostering collaborative relationships among all participants in the educational process [7].

The scholar G. Espolova emphasized that, in the process of comprehending the specific features of exploratory research activity, students – as pioneers – begin to exhibit and develop various abilities. This, in turn, stimulates the process of understanding reality through cognitive engagement with the world, the environment, and within the context of educational truths and scientific knowledge [8]. Such research activity brings students closer to science-intensive inquiry, while retaining its unique characteristics: the subject of research is aligned with the school curriculum requirements and involves a subjective scientific discovery – namely, the attainment of a genuine result that is novel for the student as a researcher.

Synthesizing the views of scholars, research can be defined as a child's cognitive activity aimed at the discovery and assimilation of new knowledge. Research skills demonstrate that in order to develop critical thinking, problem-solving abilities, and analytical skills - as well as to foster curiosity - teachers must engage younger students in various projects, experiments, and research tasks. For instance, research abilities in primary school students can be cultivated through hands-on activities such as observing natural phenomena, studying plants and animals.

In the course of research activity, it is defined as a cognitive process aimed at generating new knowledge and contributing to the understanding of cognitive patterns and phenomena. Research activity represents a specific form of educational and instructional practice, enabling students to carry out creative and inquiry-based tasks with the goal of achieving open-ended outcomes. Moreover, research skills serve as a foundation for developing abilities related to understanding the surrounding world, formulating questions, seeking answers, and articulating thoughts freely. The formation of these skills helps to increase students' cognitive interest, deepen and systematize their knowledge, and apply it in practice.

Curiosity is a person's interest in seeking new information and expanding their knowledge. This quality fosters the development of cognitive activity and the refinement of research skills. With the support of teachers, students are encouraged to engage in independent inquiry, gather new data, and broaden their understanding. Curiosity forms the basis for the development of essential abilities such as creativity, critical thinking, and the pursuit of discovery. In addition, teaching students to use various sources of information – including internet resources and digital books - enables them to enhance their creative potential.

Creativity is the ability of a child to generate new ideas and find original solutions. To foster creativity, educators should offer various creative tasks and projects tailored to primary school students. For example, young learners can develop their creative abilities through activities

such as drawing, writing poems, and building models. In addition, group work and role-playing games serve as effective tools for stimulating creative thinking in younger students.

The drive for discovery refers to a child's desire to explore and learn new things. To develop this drive, teachers should introduce students to a range of scientific and creative projects. Primary school students are encouraged to explore engaging topics across different subjects, learn to experiment, analyze new data, and draw conclusions.

Involving primary school students in various projects aimed at enhancing their research abilities, conducting experiments, and developing independent information-seeking skills helps them acquire research competencies. In doing so, they not only gain scientific knowledge but also learn how to effectively address diverse real-life situations.

Research Methods

Research methods and materials play a significant role in the development of research skills among primary school students within an informational educational environment. In this regard, the following table outlines the proposed research methods:

Table 1

Research Methods

Research Methods	Description
Survey and interview	– Use of questionnaires and interviews to determine the opinions of students and teachers – Analysis of questionnaire results and summary of findings
Experiments	– Ensure that students acquire new knowledge through practical activities – Record and discuss the results of the experiment
Project method	– Design projects for students aimed at studying or solving a specific problem – Plan, implement, and evaluate each stage of the project
Case method	– Provide students with case studies focused on solving real-life situations – Analyze the case, make decisions, and discuss the results
Electronic resources	– Use of scientific articles, encyclopedias, e-books, and online resources – Access to information databases

Multimedia tools	– Use of interactive whiteboards, computers, tablets, and other multimedia tools – Use of video materials, audio recordings, and animations
Experimental equipment	– Use of laboratory equipment, chemical reagents, and other experimental tools – Materials required for conducting practical activities
References	– Books, journals, and study guides for learning – Textbooks and manuals across various disciplines

Primary school students' research skills development

The formation of research skills in primary school students is an essential aspect of educating them to be knowledgeable and creative individuals. An informational educational environment stimulates younger students to engage in research, think critically, and acquire new knowledge.

Analysis and Results

We will focus on definitions concerning the development of research skills in students engaged in scientific research activities within the scope of the topic:

Research is a cognitive process directly aimed at generating organized new knowledge, as well as cognitively objective patterns and trends in the development of phenomena;

Research activity is a form of organizing students' educational work, aimed at solving creative and research-oriented tasks based on results that are not known in advance;

Research skills are the foundation for young learners to explore the surrounding world, ask questions, seek answers, and express themselves;

Development of research skills enables students to cultivate cognitive interests, engage in independent work, systematize, summarize, and deepen knowledge in a specific subject area, and learn to apply this knowledge in practice.

The primary school stage plays a crucial role in the development of these abilities. Table 2 presents methods and recommendations aimed at fostering students' research skills.

Table 2

Methods and Recommendations aimed at primary school students' research skills development

Method and suggestions	Description
Encouraging questioning	– Group discussions: ask questions that encourage students to express their thoughts during the lesson. For example: "Why doesn't the sun shine all the time?" or "How are rivers formed?"

	– Creating a question board: after each lesson, students write down the questions they asked and discuss them during the next class.
Organizing research projects	– Topic selection: provide students with the opportunity to choose topics of interest, such as plant growth, animal life, or weather phenomena. – Step-by-step instructions: offer clear guidelines to simplify the research process, including information gathering, analysis, and summarizing results.
Applied learning methods	– Experiments: conduct simple scientific experiments. For example, creating a model to demonstrate the water cycle. – Outdoor exploration: encourage students to go outside the classroom and explore nature. For instance, observing plants in a garden.
Using informational resources	– Library use: encourage students to visit the library and read books related to their chosen topics. – Online resources: teach students how to gather information using safe and reliable internet sources.
Development of creativity and critical thinking	– Drawing and modeling: provide opportunities for students to present their research through illustrations, collages, or models. – Critical analysis: develop students' ability to analyze collected information and verify its reliability.
Teamwork and collaboration	– Group projects: divide students into small groups and provide opportunities to carry out collaborative research projects. – Role distribution: enhance cooperation by assigning specific roles to each team member (e.g., information gatherer, writer, illustrator).
Showcasing achievements and rewarding	– Presentations: provide students with the opportunity to present their research projects to the class, which fosters a sense of pride in their work. – Awards and certificates: boost students' motivation by recognizing and rewarding those who achieve specific successes.

Ongoing support and feedback	– Individual guidance: observe each student's research process and provide personalized advice and support. – Feedback: support student development by reviewing their work and offering constructive feedback.

Conclusion

Thus, it has been proven that the development of Research Skills in Primary School Students is a vital component aimed at fostering their cognitive abilities, critical thinking, analytical reasoning, and problem-solving skills. These competencies enhance students' interest in acquiring new knowledge and contribute to the development of their intellectual and creative potential. By cultivating research skills, students engage in independent inquiry and investigative activities, acquiring creative thinking abilities and effective problem-solving strategies. Teacher support plays a key role in the successful implementation of this process, enabling students to become active learners. The application of the aforementioned methods and techniques can significantly enhance students' research interest and effectively develop their research competencies.

With the encouragement and guidance of teachers, the creative and critical thinking abilities of primary school students are strengthened, fostering their active participation in the learning process.

Authors' contribution

Gelişli Y. – As a research supervisor, critically examine the content of the article and the author's definition of the concept of "research skills in primary school students," summarized as the novelty of the research. Provide appropriate suggestions and revisions; approve the final version of the article for publication.

Kurebay B. – The issue of developing research skills in primary school students has become increasingly important in the context of modern education. A thorough review and systematization of theoretical and practical materials have made it possible to identify essential pedagogical conditions, methodological tools, and educational strategies that support the formation of these skills. Emphasis is placed on the integration of research elements into the educational process, the role of inquiry-based learning, and the significance of teacher facilitation in guiding students through exploratory tasks.

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Abstract. This article provides a detailed discussion of the issue of developing research skills in primary school students within an informational educational environment. It is noted that through the cultivation of research competencies, young learners enhance their critical thinking, analytical abilities, and problem-solving skills. With the support of teachers, they participate in scientific projects, conduct experiments, and acquire methods for independent information seeking. This process increases their interest in acquiring new knowledge and contributes to the development of their intellectual and creative potential. The article emphasizes that fostering curiosity, creativity, and the pursuit of novelty plays a decisive role in the personal development of primary school students, thereby enhancing their cognitive interests and motivating them toward active learning.

The article also addresses the concepts of inquiry, curiosity, creativity, and the desire for discovery, emphasizing that their development is particularly important at the primary school stage. It is demonstrated that primary school students' research abilities can be effectively nurtured through participation in research projects, conducting experiments, and engaging in independent information-seeking activities.

This research study explores the concepts of inquiry, research activity, and the development of research skills in students. Research is defined as a process aimed at acquiring new knowledge that

facilitates understanding of cognitive patterns and phenomena. Research activity is presented as a specific form of educational and developmental work that enables students to carry out creative and research-oriented tasks in order to achieve results that were previously unknown.

Keywords: primary school, research skills, informational and educational learning, critical thinking, creativity, educational process, pursuit of innovation.

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