



PEDAGOGICAL CONDITIONS FOR THE FORMATION OF STUDENTS' RESEARCH ACTIVITIES BASED ON AN INTEGRATIVE APPROACH

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Abstract: This article provides a scientific and theoretical analysis of the pedagogical conditions for forming students' research activities based on an integrative approach. Issues regarding the effective organization of interdisciplinary integration in the educational process, the development of students' independent thinking, analytical approaches, problem-solving, and scientific research competencies are highlighted. Additionally, the importance of innovative pedagogical technologies, digital educational tools, and a competency-based approach in organizing research activities is substantiated.

Keywords: integrative approach, research activity, pedagogical conditions, interdisciplinary integration, research competence, creative activity, digital education.

Introduction

In the modern educational process, it is not enough for students to master ready-made knowledge; one of the important pedagogical tasks is to direct them toward independent research, scientific thinking, problem analysis, and the drawing of well-founded conclusions. Because in today's conditions of globalization and digital development, society needs creative, proactive individuals with research skills who can interconnect knowledge across various disciplines. From this perspective, the formation of students' research activities is emerging as one of the priority areas of the education system.

Research activity ensures that the student transforms from a simple learner into an active research subject. In the process of such activity, the student performs important intellectual actions such as asking questions, identifying problems, making assumptions, collecting information, observing, comparing, conducting experiments, and analyzing and summarizing results. This develops logical thinking, critical thinking, the ability to make independent decisions, and a creative approach. Especially at the school education stage, the formation of such skills plays an important role in the future professional orientation of students, their preparation for higher education, and the development of their life competencies.

An integrative approach occupies a special place in this process. The integrative approach involves organizing the content of education not within the framework of separate disciplines, but based on the organic connection between them, general patterns, and life problems. Because real-life problems are often not solved within the boundaries of a single discipline. For example, when studying an environmental problem, knowledge related to biology, geography, chemistry, mathematics, and even social sciences is required. Therefore, the integrative approach allows students to understand knowledge as a holistic system, compare information from various sources, and apply it in practical situations.

An educational process organized on the basis of an integrative approach ensures that students naturally engage in research activities. In this case, the student studies a phenomenon

or problem not only theoretically, but also in the context of various disciplines, in practical and life connections. As a result, he develops the ability to analyze, link, apply to new situations, and explain knowledge on a scientific basis, rather than memorizing it mechanically. This serves to develop the main components of research competence.

The proper organization of pedagogical conditions is of great importance in the formation of students' research activities. First of all, it is necessary to create an opportunity for free thinking, asking questions, research and creative initiative in the educational environment. In this process, the teacher should act not as a ready-made knowledge provider, but as a guide, advisor, and partner. It is also necessary to take into account the age characteristics of students, their interests, individual capabilities, and the level of subject preparation. In such conditions, the student feels like an active participant in the educational process.

Today, the use of innovative pedagogical technologies, the project method, problem-based learning, the STEAM approach, digital educational tools, and information and communication technologies in the formation of research activities is becoming increasingly relevant. In particular, project-based and research-based tasks develop students' skills in conducting independent research, working in a team, reviewing scientific sources, presenting results, and defending their opinions based on evidence. This process fosters not only knowledge but also responsibility, initiative, communicative culture, and creative activity in students.

At the same time, the formation of research activities based on an integrative approach requires a high level of professional training from the teacher. The teacher must be able to see interdisciplinary connections, harmonize lesson content with real-life problems, and organize students' research activities step-by-step. In this process, students are provided with methodological assistance in selecting a research topic, defining goals and objectives, proposing hypotheses, selecting methods, analyzing results, and drawing conclusions. The formation of students' research activities based on an integrative approach enriches the educational process in terms of content and brings it into a life-affirming, practical, and creative direction. This approach serves to develop students' interdisciplinary thinking, independent research, analytical thinking, and innovative perspectives. Therefore, studying this topic from a scientific and pedagogical perspective, identifying its effective conditions, and implementing them into practice is one of the important tasks facing today's education system.

Discussion

The issue of forming students' research activities based on an integrative approach is of particular importance in today's educational process. Because a modern school is not only an educational institution, but also a pedagogical environment that prepares students for independent thinking, research, the ability to see problems and find scientifically based solutions to them. Therefore, to develop students' research activities, it is necessary to create an educational system based on interdisciplinary connections, possessing practical content, and forming the student as an active subject.

First and foremost, the integrative approach serves the student's perception of knowledge not within the framework of individual disciplines, but as an integrated system. In traditional education, subjects are often taught separately from one another. As a result, the student cannot sufficiently understand the connection between the knowledge gained in mathematics, biology, chemistry, geography or literature. The integrative approach softens these boundaries and



teaches the student to comprehensively analyze events and processes. For example, when studying an environmental problem, biological processes, chemical factors, geographical conditions, mathematical calculations, and issues of social responsibility are analyzed together. Such an approach fosters scientific thinking, an analytical approach, and the ability to draw practical conclusions.

The research activity of students begins, first and foremost, with the formation of a culture of asking questions. Because any research begins with a problem or a question. In an integrative educational environment, the student is not limited to memorizing simple facts, but reflects on questions such as "why?," "how?," "how does this situation relate to other subjects?," "how can this problem be solved?." Such questions encourage the reader to actively search, compare sources, and conduct experiments and observations. As a result, the student becomes not a recipient of knowledge in a ready-made form, but a subject who independently searches for and processes it.

Proper organization of pedagogical conditions is an important factor in this process. First and foremost, it is necessary to create a favorable psychological and pedagogical environment for the student to think freely, justify their opinion, put forward alternative views, and search without fear of making mistakes. If a student is forced to find only the correct answer during the educational process, their research activity will not develop sufficiently. On the contrary, when given the opportunity to discuss various opinions, put forward hypotheses, analyze mistakes and draw conclusions from them, the student's interest in scientific research increases.

The second important condition is the teacher's methodological training. The formation of research activities based on an integrative approach requires the teacher to be able to see not only knowledge in their subject but also the connection with other disciplines, correctly define research tasks for students, and guide them toward the stages of scientific research. In this case, the teacher acts not as a manager, but as an advisor, guide, and partner. It provides methodological assistance to students in choosing a problem, setting a goal, proposing a hypothesis, choosing a method, collecting information, analyzing results, and presenting them.

The third condition is the connection between the content of education and life and practical problems. Only when a student understands the content of research activity in connection with life does an internal need for research form within them. For example, topics such as water conservation, environmental protection, a healthy lifestyle, studying local historical monuments, environmental problems in the region, or the impact of digital technologies on daily life will naturally interest students. Such topics are integrative in nature and require the integration of knowledge from several disciplines.

The use of the project method, problem-based learning, research-based learning, the STEAM approach, case studies, experimentation, and observation methods is effective in forming research activities. In particular, the project method develops students' skills in independent work, teamwork, information search, analysis, and presentation of results. Problem-based learning, on the other hand, encourages the student not to find a ready-made answer, but to search for the problem, ask questions, and find solutions. The STEAM approach ensures the integration of science, technology, engineering, art, and mathematics, developing students' creative and analytical thinking.



Furthermore, the use of digital educational tools plays an important role in developing students' research activities. Internet resources, electronic libraries, virtual laboratories, educational platforms, online surveys, and presentation programs allow students to search for information, analyze it, and present results visually. However, when using digital tools, adherence to the principles of information culture, critical assessment of sources, avoidance of plagiarism, and academic integrity is of particular importance. This is because research activity is not only the collection of information but also the process of its analysis, processing, and independent conclusion-making.

When forming research activities based on an integrative approach, it is also important to consider the age and individual characteristics of students. Research activities in primary grades can be organized through simple observation, question-and-answer sessions, experimental elements, and small practical assignments. In the upper grades, more complex types of activities are used, such as project work, writing scientific articles, analyzing experimental results, using statistical data, and preparing scientific presentations. This step-by-step approach allows for the consistent development of students' research competence.

Another important aspect of the issue under discussion is the evaluation system. It is insufficient to evaluate students' research activities solely by the final result. In this process, such stages as problem identification, planning, working with sources, conducting experiments, analysis, working in a group, drawing conclusions, and presenting the results should also be evaluated. Therefore, it is advisable to use criteria assessment, rating cards, reflection sheets, portfolios, and mutual assessment methods. Such an assessment reflects not only the student's level of knowledge but also their activity and development dynamics in the research process.

The effectiveness of the integrative approach is that it prepares students to analyze complex problems in real life. Today, the environmental, technological, social, and cultural problems facing humanity are multifaceted in nature. Knowledge within a single discipline is insufficient to solve such problems. Therefore, it is necessary to strengthen interdisciplinary integration in school education and to develop students' skills in comprehensive thinking, scientific research, and a creative approach. In the future, this will serve to educate a young generation capable of innovative thinking, making independent decisions, and drawing scientifically based conclusions.

At the same time, there are certain problems in the practical implementation of the integrative approach. In particular, some teachers lack sufficient methodological experience in organizing interdisciplinary integration, curricula are sometimes limited within specific subjects, and the material and technical base and time resources necessary for research activities are limited. To overcome such problems, it is important to provide methodological support to teachers, develop interdisciplinary lesson plans and project assignments, and organize scientific circles, small laboratories, creative groups, and research clubs in schools. The formation of students' research activities based on an integrative approach requires a new organization of the content, methods, tools, and assessment system of the educational process. This approach shapes the student not as a passive recipient of knowledge, but as an individual who seeks, analyzes, and strives to create. With the correct organization of pedagogical conditions, an integrative approach allows for the effective development of students' scientific worldview, research competence, creative thinking, and readiness for practical activity.



The formation of students' research activities based on an integrative approach is considered one of the important pedagogical directions of the modern education system. This approach serves to help students understand knowledge not within the framework of individual disciplines, but as an interconnected and integrated system. As a result, students develop scientific thinking, an analytical approach, independent thinking, problem-solving, and creative search skills.

Conclusion

In the course of the study, it was established that the pedagogical possibilities of the integrative approach in organizing students' research activities are broad. The educational process, organized on the basis of interdisciplinary integration, helps to connect students' theoretical knowledge with practical activities, harmonize knowledge from various disciplines, and analyze real-life problems on a scientific basis. This serves as an important factor in developing students' research competence.

The necessity of certain pedagogical conditions for the effective formation of research activities was also substantiated. In particular, the creation of a free and creative educational environment, support for students' independent activities, the use of innovative pedagogical technologies and digital educational tools, and the introduction of project and problem-based learning methods are of great importance. At the same time, it is necessary to develop the methodological competence of teachers, strengthen interdisciplinary cooperation, and improve modern mechanisms for evaluating research activities.

Research activities organized on the basis of an integrative approach not only increase the level of students' knowledge but also develop their communicative culture, teamwork skills, information management competence, and innovative thinking abilities. This serves as an important pedagogical basis for training future competitive specialists capable of making independent decisions and meeting the requirements of modern society. The integrative approach is a pedagogically effective tool for the effective formation of students' research activities. The widespread introduction of this approach into educational practice serves to develop students' scientific worldview, research potential, and creative competencies, and plays an important role in raising the quality of education to a new level.

References:

1. Xodjayeva N. S., Karimov U. U. Integrativ yondashuv asosida o'quvchilarda tadqiqotchilik kompetensiyasini rivojlantirish masalalari // Xalq ta'limi. — 2021. — № 4. — B. 45–52.
2. Rasulov A. R. Ta'lim jarayonida fanlararo integratsiyaning pedagogik imkoniyatlari // Pedagogik mahorat. — 2022. — № 3. — B. 67–73.
3. Axmedova D. M. O'quvchilarning ilmiy-tadqiqot faoliyatini tashkil etishda innovatsion texnologiyalarning ahamiyati // Uzluksiz ta'lim. — 2023. — № 2. — B. 81–88.
4. Yuldashev B. K. Kompetensiyaviy yondashuv asosida tadqiqotchilik faoliyatini rivojlantirish metodikasi // Zamonaviy ta'lim. — 2024. — № 1. — B. 54–61.
5. Ergasheva M. T. STEAM ta'lim muhitida o'quvchilarning ijodiy va ilmiy izlanish faoliyatini rivojlantirish // Pedagogika va psixologiya. — 2022. — № 5. — B. 90–97.
6. Tursunov Q. O. Raqamli ta'lim texnologiyalari asosida ilmiy-tadqiqot kompetensiyalarini shakllantirish // Ta'lim va innovatsiya. — 2023. — № 6. — B. 101–108.



7. Mamatov S. A. Umumiy o'rta ta'limda integrativ yondashuvning didaktik asoslari // Ilm sarchashmalari. — 2021. — № 7. — B. 33–40.
8. Abdullayeva N. Sh. O'quvchilarning mustaqil tadqiqotchilik faoliyatini rivojlantirishning pedagogik mexanizmlari // Academic Research in Educational Sciences. — 2024. — Vol. 5, № 2. — B. 120–128.