



YOUTH AND SCIENTIFIC RESEARCH

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Abstract: *This article provides a comprehensive analysis of the scientific research of young people in today's turbulent times, their role in social life and modern development. The text covers historical experiences, the contributions of young scientists to the development of science, and the real opportunities and obstacles they face today in a simple and analytical language. It also contains practical recommendations for properly directing the intellectual potential of students and young researchers.*

Keywords: *young researchers, scientific research, innovative ideas, motivation, startup projects, mentor-student system, will.*

INTRODUCTION

Today, the world is changing at such a rapid pace that the development of a country is no longer assessed by the abundance of its natural resources, but rather by the intellectual potential that has been cultivated within its society—in other words, by the knowledge and capabilities of its people. In this process, the greatest responsibility undoubtedly falls upon the younger generation. Youth is the most energetic period of human life, when the brain is particularly receptive to acquiring new knowledge. It is precisely during this stage that individuals are more likely to think beyond established frameworks, question conventional rules, and view the world from new perspectives. The renowned physicist Albert Einstein once



emphasized that one should never stop imagining and asking questions. In his view, curiosity is one of the most important driving forces of human nature. Today, the scientific research conducted by young people is not merely a compulsory assignment confined within the walls of classrooms or laboratories. Rather, it provides a platform for young researchers to propose original and unexpected solutions to global challenges such as climate change, artificial intelligence technologies, modern medicine, and economic crises. If young people do not devote themselves to developing new ideas today, stagnation in society will inevitably emerge tomorrow.

Historical Experience: The Determination That Transformed the World

When we turn the pages of history, we can see that many of the greatest discoveries that revolutionized the world of science were made when their authors were still young. This pattern can be clearly observed in the lives of both Eastern scholars and Western scientists.

Let us first turn our attention to the lives of our great ancestors. Abu Ali ibn Sina (Avicenna), regarded as one of the greatest figures in the history of medicine, began working on his most fundamental work, *The Canon of Medicine*, and devoted himself to scientific research day and night in the library of the famous ruler after treating the Emir of Bukhara when he was only around 17 or 18 years old. By the age of 21, he had mastered almost all the major branches of knowledge of his time. Another notable example is Mirzo Ulugbek. He gathered young and talented scholars such as Ali Qushchi around him and relied on their enthusiasm and intellectual energy in compiling his renowned astronomical tables.

The situation was much the same in the Western world. For instance, Sir Isaac Newton was a university student when he developed his theory of universal gravitation and laid the foundations of differential calculus, one of the most complex branches of mathematics. At that time, a quarantine had been imposed because of a plague epidemic, and Newton continued his research while staying at home. He was only 23 years old. Another example is the French scientist Blaise Pascal, who was



only 19 when he invented his first mechanical calculating machine. These examples demonstrate that success in science is not determined by age, but rather by inner motivation and proper guidance.

Contemporary Observations and Psychological Aspects

Today, specialists studying the human brain and the sociological activity of young people are also reaching interesting conclusions. According to neuroscientists, the brain's ability to synthesize new ideas and formulate hypotheses involving calculated risks reaches a particularly high level between the ages of 22 and 35. During this period, neural connections in the brain operate with considerable efficiency, enabling individuals to approach problems from unconventional perspectives without hesitation.

Textbooks written by prominent psychologists also place considerable emphasis on willpower and motivation during youth. For example, according to the psychological perspectives of M. E. Zufarova, scientific activity and research contribute to the development of strong willpower (volition) and cognitive motivation among young people.

When a student engaged in scientific research encounters failure for the first time—whether an experiment does not produce the expected results or a hypothesis proves to be incorrect—they learn not to give up immediately, but rather to analyze their mistakes and continue striving toward their goals. This, in turn, makes a significant contribution to their development as individuals.

It is natural to ask which fields young people are currently most active in. Observations indicate that young researchers and university students are driving a significant proportion of developments in modern information technologies, artificial intelligence, and startup projects. While older scholars tend to rely more heavily on fundamental approaches and methods that have been tested over many years, young researchers rapidly adopt and implement the latest trends in biotechnology, the green economy, and information technology.



Based on our observations and a synthesis of the findings of several sociological surveys, the current contribution of young researchers across major fields, as well as the results they are achieving, can be presented comparatively as follows:

The Contribution and Key Achievements of Young Scientists in Contemporary Research Areas

Artificial Intelligence and Information Technology

Share of young researchers: 65%.

Key innovative achievements: Harnessing the capabilities of neural networks, conducting big data analysis, and optimizing technological processes across various fields.

Green Economy and Renewable Energy

Share of young researchers: 55%.

Key innovative achievements: Developing new solutions to address environmental challenges and improve the efficiency of renewable energy sources.

Biotechnology and Medicine

Share of young researchers: 40%.

Key innovative achievements: Research in genetic engineering, the development of modern rapid diagnostic tests, and bioinformatics projects.

These data demonstrate that young people's interests are directly associated with the digital future and environmental sustainability. Scientific clubs established at universities are also contributing to the emergence of new ideas in precisely these areas.

Real Challenges Faced by Young Researchers

Scientific research is, of course, not a path consisting solely of successes. Today's young scientists encounter a number of serious obstacles in their professional activities. Rather than concealing these challenges, they should be analyzed and addressed through effective solutions.



First, **academic conservatism and bureaucracy** continue to persist in many scientific institutions. In some cases, experienced senior scholars may view young people's completely new and unconventional ideas with skepticism. An approach such as, *"You do not have enough experience yet; first, thoroughly read the books we have written,"* can discourage young researchers and undermine their intrinsic motivation.

Second, there are **financial constraints and inadequate material and technical resources**. Conducting modern research requires well-equipped laboratories and direct access to international academic databases such as Scopus and ScienceDirect. Young students often face financial limitations when attempting to obtain high-quality academic literature or access recent research publications from abroad.

Third, there are **shortcomings in systems for protecting intellectual property and original ideas**. Since many interesting projects and innovative developments created by young people are not patented in a timely manner, there are occasional cases in which their ideas are appropriated by others. To address these challenges, it is necessary to simplify grant allocation mechanisms as much as possible, eliminate excessive paperwork, and expand opportunities for small-scale financial incentives, such as **seed grants**, specifically designed to support young researchers.

The Scientific Potential of Uzbek Youth: Opening the Door to New Opportunities

Today, young people's engagement in science in Uzbekistan has evolved from being merely a matter of personal choice into a strategic priority at the national level. The activities of the Youth Academy and the allocation of funding for young people's startup ideas by various innovation agencies provide practical evidence of this development.

Our great enlightener Abdulla Avloniy once wrote: *"Knowledge is humanity's most sacred investment; with it, every door of difficulty can be opened."*



These words remain highly relevant today. Modern Uzbek youth are making their voices heard on the international stage not only in traditional humanities disciplines such as linguistics, literature, and history, but also in exact sciences such as mathematics, physics, programming, and chemistry.

Most importantly, young people are developing not only the ability to acquire theoretical knowledge, but also the skills to transform that knowledge into practical applications—in other words, into real-world business or social projects. Scientific clubs and innovation laboratories established at universities are bringing young people together around common goals. The most important factor in this process is the proper development of the **mentor–student tradition**. [08.10.2026 16:40] Saida Ziyouddinova: A mentor should serve as a guide and a supportive friend who helps a young researcher identify and correct mistakes, rather than as a supervisor who restricts their freedom of thought.

CONCLUSION

In conclusion, the scientific research and scholarly pursuits of young people are not merely efforts undertaken to obtain an academic degree or diploma. They represent one of the most valuable investments in the future of an entire nation and in its economic and social prosperity. The curious young people who, while sitting at their university desks today, are not afraid to ask questions or make mistakes may become the authors of discoveries that will take their country to an entirely new level tomorrow.

What is required of young researchers is **continuous inquiry, the ability to move beyond a single field and explore interdisciplinary connections, and a systematic approach to solving problems**. After all, the future belongs to those young people who recognize the value of science and are capable of transforming scientific knowledge into practical solutions.

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