

University of Technology Katowice



**INNOVATIVE APPROACHES TO
ENSURING THE QUALITY OF
EDUCATION, SCIENTIFIC RESEARCH
AND TECHNOLOGICAL
PROCESSES**

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Innovative Approaches to Ensuring the Quality of Education, Scientific Research and Technological Processes

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PREFACE

The monograph is devoted to the definition of innovative approaches to ensuring the quality of education, scientific research and technological processes. Today one can say that the basis for growth and sustainable development is the provision of quality of products and services. Therefore, improving the quality level and assessing the effectiveness of activities should be the priority tasks for organizations and enterprises. Quality management is a dynamic process that develops and improves in accordance with the development of scientific thought, methods, technological solutions and technical training. The engine of global processes is undoubtedly innovation. For the competitiveness of enterprises, specialists, countries, it is necessary to search for tools and mechanisms for innovative development.

The presented monograph is a large-scale study of leading scientists, teachers, practitioners, engineers, doctors. It is a logical continuation of the I International Scientific and Practical Conference “Science. Innovation. Quality”, which was attended by about 300 researchers from 12 countries. The purpose of the conference was to identify ways to organize effective international scientific and technical cooperation, promote the innovative development of scientific knowledge, ensure the quality of research and establish mechanisms for technology transfer for sustainable development of society. The monograph summarizes the main questions that were raised during the conference and allows for a more detailed and in-depth study of innovative processes, technologies and mechanisms for achieving high performance and efficiency of any activity.

The first section is devoted to general issues of modern development of science. The authors highlighted the latest advances in nanoengineering, energy, ecology, materials science and the like. This section provides the understanding that knowledge-based technologies require innovative approaches and should be based on the principles of ensuring high quality processes.

The second section provides a detailed overview of the tools and mechanisms of modern innovative development. The authors presented the concepts of innovative and investment development, models for the formation of an innovative policy for the development of enterprises and organizations, approaches to managing organizational changes based on an integrated system of indicators, quality assurance tools.

The logical continuation of these developments is the practice-oriented research presented in the third section of the monograph. Here are collected modern views on innovation in education and science. The logic of research is provided by a detailed study of innovative processes, that becomes a reliable basis for the development of all levels of modern education – from preschool education to adult education. Considerable attention is paid to new forms of organization of educational and work processes. The modern technologies of distance, remote, mixed forms of organization of education and work are presented. Also, this section of the monograph summarizes the research results of the complex topic “Design and development of physical equipment for educational institutions” (No.0116U002971), which was carried out at the Department of Physics and Methods of Teaching Physics of Berdyansk State Pedagogical University.

The fourth section of the monograph reveals the methods and mechanisms for ensuring the quality of innovative products and technologies in various sectors of the economy: industrial, food, agricultural, tourism, etc. Methodical, methodological and metrological aspects of ensuring and controlling the quality of products, goods, materials, processes are presented.

The fifth section explores innovative approaches in the medical and pharmacological fields. These industries are aimed at maintaining the health of the population and a high quality of life. However, taking into account the current pandemic, we must state that they are among the most vulnerable. That is why medicine and pharmacology need support to qualitatively resist modern challenges.

Thus, the monograph shows that quality assurance is a necessary condition for sustainable innovation development. All branches of scientific research, spheres of economic and industrial activity, education need innovations. Science, innovation, quality are the main levers and drivers of society development. Only an integrated systematic approach will ensure sustainable development and competitiveness on the world arena.

The authors hope that the monograph contains useful research results relevant to researchers, scientists, professionals and anyone interested in ensuring high quality standards and innovative development.