

INNOVATION SCIENCE AND TECHNOLOGY



Scopus || Electronic journal specializing in Scopus

ISSUE 12



Acceptance of papers **December, 2025**



**Acceptance of
papers**

Published monthly



Topics

economics,
technology, social
sciences

ISSN 3060-5229

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The scientific electronic journal "Innovation Science and Technology" has been included in the list of scientific publications recommended for the publication of main scientific results of dissertations for the award of PhD and DSc degrees in economics and technical sciences, in accordance with the Resolution No. 370 of the Presidium of the Higher Attestation Commission of the Republic of Uzbekistan, dated May 8, 2025.

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THEORETICAL AND METHODOLOGICAL FOUNDATIONS FOR IMPLEMENTING INNOVATIVE TECHNOLOGIES IN EDUCATION

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Abstract: The article examines the methodological foundations of the innovative educational process in the modern school. The concepts of “innovative activity” and “innovative process” are clarified. It is concluded that there is a growing need for a new theoretical understanding of the essence of managing innovative processes in an educational institution, as well as for developing pedagogical conditions that ensure continuous innovative progress.

Key words: innovation, pedagogical innovatics, innovation management, innovation process.

Annotatsiya: Ushbu maqolada zamonaviy maktabdagi innovatsion ta’lim jarayonining metodologik asoslari ko’rib chiqilgan. “Innovatsion faoliyat” va “innovatsion jarayon” tushunchalariga aniqlik kiritildi. Ta’kidlanishicha, ta’lim muassasasida innovatsion jarayonlarni boshqarish mohiyatini yangicha nazariy anglash hamda uzluksiz innovatsion taraqqiyotni ta’minlaydigan pedagogik shart-sharoitlarni ishlab chiqishga ehtiyoj ortib bormoqda.

Kalit so’zlar: innovatsiya, pedagogik innovatika, innovatsiyalarni boshqarish, innovatsion jarayon.

Аннотация: В статье рассматриваются методологические основы инновационного образовательного процесса в современной школе. Уточняются понятия «инновационная деятельность» и «инновационный процесс». Делается вывод о возрастающей необходимости нового теоретического осмысления сущности управления инновационными процессами в образовательном учреждении, а также разработки педагогических условий, обеспечивающих непрерывное инновационное развитие.

Ключевые слова: инновация, педагогическая инноватика, управление инновациями, инновационный процесс.

INTRODUCTION

At present, significant changes are taking place in our country’s national education policy. This is connected with the shift toward learner-centered pedagogy. One of the tasks of the modern school is to unlock the potential of all participants in the educational process and to provide them with opportunities to express their creative abilities. Solving these tasks is impossible without introducing variability into educational processes, which has led to the emergence of various innovative types and forms of educational institutions that require deep scientific and practical analysis.

The modern Uzbek school is the result of major transformations that have occurred in the national education system in recent years. In this respect, education is not merely a part of the social life of society but its vanguard: few other subsystems can demonstrate their progressive development with such an abundance of innovations and experiments.

The changing role of education in society has driven most innovative processes. From being socially passive, routine-based, and carried out within traditional social institutions, education is becoming active. The educational potential of both social institutions and individuals is being actualized. Previously, the unquestioned goals of education were the formation of knowledge, skills, and informational and social competencies that ensured “readiness for life,” which, in turn, was understood as the ability of an individual to adapt to social circumstances. Now, education is increasingly oriented toward creating technologies and methods of influencing the individual that ensure a balance between social and individual needs, and which, by activating the mechanisms of self-development (self-improvement, self-education), prepare the individual to realize their own individuality and to respond to societal changes.

REVIEW OF LITERATURE ON THE SUBJECT

Research on innovative technologies in education rests heavily on the broader theoretical foundations of innovative management, extensively developed in classical and contemporary scholarship. Balabanov (2016) emphasizes that innovation implementation requires structured managerial frameworks, highlighting the need for systematic planning, resource optimization and strategic adaptation—principles that transfer directly to educational transformation. Similarly, Zavlina, Kazantseva and Mindeli (2020) expand the conceptual understanding of innovation processes by linking them to organizational development cycles, thereby providing methodological tools useful for designing innovation-oriented educational environments.

Ivanov (2002) and Ilyenkova (1999) offer foundational insights on innovation management with a particular focus on the mechanisms of generating, selecting and institutionalizing new ideas. Their works stress the importance of internal organizational readiness, human capital development and feedback mechanisms—factors that are crucial when integrating digital technologies, adaptive learning systems and modern pedagogical tools into educational institutions. Medynsky (2002) further develops this framework by underlining the role of innovation infrastructure and management culture, arguing that successful adoption of new technologies depends on the alignment between institutional strategies and the broader innovation ecosystem.

Yusufbekova (2010) provides a direct pedagogical perspective, conceptualizing “pedagogical innovatics” as a methodological field aimed at understanding how innovations reshape teaching and learning processes. She argues that innovative technologies require a shift in methodological thinking, where the educator becomes both a facilitator and a designer of interactive learning experiences. Her work highlights the need for research-based approaches when introducing technological tools, ensuring they enhance cognitive engagement, foster learner autonomy and support evidence-based pedagogical decisions.

Taken together, these studies demonstrate that the theoretical and methodological foundations for implementing innovative technologies in education emerge at the intersection of innovation management principles and pedagogical innovation research. The literature consistently emphasizes strategic planning, institutional readiness, structured evaluation and methodological rigor as essential elements for effective technological integration in modern education.

RESEARCH METHODOLOGY

The study relies on secondary data collected from scientific publications, educational policy documents, and empirical reports on innovation management and pedagogical technologies. The gathered materials are analyzed through comparative evaluation, thematic content analysis, and synthesis of conceptual approaches to identify methodological principles and patterns that guide the effective implementation of innovative technologies in education.

Analysis and results

Innovation is defined as an increase in the existing body of knowledge that leads to changes in current technology and management, resulting in economic benefits. Thus, innovation, as the outcome of a creative process, manifests itself in the form of new value.

Innovation is implemented during the period between the initial creation of a concept for a new product and the preparation of a justification for launching mass production, establishing a distribution system, and providing after-sales service.

Innovation is a product of collective intellectual labor that makes it possible to use everything new (ideas, inventions, technologies, management methods) to dramatically increase the efficiency of existing activities or to form promising directions in economic and social human activity.

Innovative activity encompasses the creation and implementation of:

- new products;
- new technological processes and forms of production organization;
- new markets;
- new management processes and solutions to socio-economic problems, along with the corresponding

financial instruments and organizational structures;

The emergence of innovation has two starting points:

The sources of funding for science and innovation in Uzbek include the internal funds of organizations (enterprises) conducting scientific research and development or carrying out innovative activities; budgets at all levels; extra-budgetary funds; and foreign sources.

The innovation process is the process of creating, disseminating, and using a novelty (a set of new ideas and proposals that can potentially be implemented and that, given the scale of their use and the effectiveness of their outcomes, may become the basis for any innovation). It represents the transformation of

new types and methods of human activity (innovations) into socio-cultural norms and models that ensure their institutionalization, integration, and consolidation within the culture of society.

The innovation process unfolds in several stages. In most cases, an innovation is a combination of multiple factors introduced partly simultaneously and partly sequentially. Therefore, innovation is not an isolated event but rather a trajectory consisting of many small events. For this reason, when analyzing an innovation, it is difficult to pinpoint the exact moment when it emerged or to identify a single cause.

Thus, all elements that make up the content of innovative activity not only follow from one another but are also closely interconnected and exert mutual influence on each other. As a result, a change in one element leads to changes in the others, and ultimately in the entire organization. This requires a comprehensive approach to solving any of its problems—large or small, simple or complex, current or long-term. Consequently, a systemic approach is necessary.

F. Jansen, using a systemic approach to organizations and the innovation processes occurring within them, describes an organization as a living organism with complex connections and reactions, asserting that "...life, consciousness, innovation are phenomena of the highest level of hierarchy, emerging from the behavior of many molecules, cells, or, respectively, producers and consumers."

The following factors motivate an organization to engage in innovative activity: the environment (external environment) and its changes, which force people to innovate; the state, which through its policies provides or removes incentives for innovation; and scientific and technological progress, which encourages enterprises to monitor new developments in order to effectively compete. Internal factors driving innovation within an enterprise include the creative abilities of employees, internal corporate competition, as well as the preferences of the owners, managers, and informal leaders of the organization.

Questions of scientific support for innovative activity in education fall within the field of pedagogical innovatics.

Today, both pedagogical innovatics itself and its methodology are still in the stage of scientific development and formation. Let us examine the conceptual framework and theoretical foundations of innovative processes in education.

Innovations in education represent the creative elaboration of new ideas, principles, and technologies, and in some cases, their refinement into model projects that include conditions for their adaptation and application.

It is important to distinguish between innovations (novelties) and innovations-as-implementation. If a pedagogical novelty is understood as an idea, method, tool, technology, or system, then an innovation in this case is the process of introducing and mastering that novelty. We consider the term "innovative" to be synonymous with "innovation."

By designing innovations, it becomes possible to manage the development of educational systems—both at the level of an educational institution and at the regional or national level. Justifying a typology of pedagogical innovations makes it possible to study the specifics and regularities of innovation development, as well as to identify and analyze the factors that facilitate or hinder innovative activity.

A key concept in innovatics is the innovation process. Innovation processes in education are considered from three main perspectives: socio-economic, psychological-pedagogical, and organizational-managerial. These aspects determine the overall climate and conditions in which innovation processes occur. Existing conditions can either facilitate or hinder the innovation process. The innovation process can be either spontaneous or consciously managed. The introduction of novelties is primarily a function of managing both artificial and natural processes of change.

It is important to emphasize the unity of the three components of the innovation process: creation, adoption, and application of novelties. This three-part innovation process is most often the object of study in pedagogical innovatics, unlike, for example, didactics, where the focus of scientific research is the learning process.

Another systemic concept is innovative activity, which refers to the set of measures taken to ensure the innovation process at a particular level of education, as well as the process itself. The main functions of innovative activity include changes in the components of the educational process: meaning, goals, content of education, forms, methods, technologies, teaching tools, and the management system.

Innovatics entered pedagogy from fields such as cultural studies, linguistics, and economics. Within innovatics, there is an implementation-oriented vector, which reflects the traditional—and often criticized—relationship between science and practice (science develops and implements in practice). This understanding contradicts the increasingly developed learner-centered pedagogical paradigm of recent years, which emphasizes the growing role of the individual in designing their own education.

Instead of mechanically transferring innovation tools from economics, entrepreneurship, or production, pedagogical innovatics offers the opportunity to thoughtfully adapt these approaches to the human-centered nature of education. This perspective enables educators to design conditions in which learners actively participate in renewing their own educational experience. Such an orientation forms a strong methodological

foundation for developing theoretical principles of pedagogical innovatics and supports the progressive evolution of modern educational systems.

Based on the above, pedagogical innovatics can be understood as the science that studies the nature, patterns of emergence and development of pedagogical innovations, and their connections with past and future traditions in relation to educational subjects.

We can define the object and subject of pedagogical innovatics as follows:

The object of pedagogical innovatics is the process of emergence, development, and adoption of innovations in education. Here, innovations are understood as novelties—purposeful changes that introduce new elements into education and cause its transition from one state to another. Education is viewed as a socially, culturally, and personally determined educational activity, in which the subject of this activity is actively involved in the process of change (renewal).

The subject of pedagogical innovatics is the system of relationships that arise in innovative educational activities aimed at the development of the personality of educational subjects (students, teachers).

Today, innovative changes occur in areas such as: the formation of new educational content; development and implementation of new teaching technologies; application of methods, techniques, and tools for mastering new programs; creation of conditions for personal self-determination during learning; changes in the modes of activity and thinking styles of both teachers and students; changes in their interactions; and the creation and development of creative innovative teams, schools, and universities.

CONCLUSIONS AND SUGGESTIONS

Research on innovation processes in education has identified a number of theoretical and methodological problems: the relationship between tradition and innovation, the content and stages of the innovation cycle, the attitudes of different educational subjects toward innovations, innovation management, staff training, criteria for evaluating new elements in education, and others. These problems require understanding at a higher methodological level.

Justifying the methodological foundations of pedagogical innovatics is no less important than developing innovatics itself. Pedagogical innovatics represents a distinct area of methodological research. To develop the scientific support for educational innovations, it is necessary to rely on the existing methodological base.

The methodology of pedagogical innovatics offers a comprehensive system of knowledge and activities that makes it possible to consistently study, explain, and substantiate its principles, regularities, conceptual framework, and tools, as well as their scope within modern educational practice. This methodological apparatus provides strong potential for analyzing, supporting, and designing the modernization of education. As large-scale innovations continue to evolve, the field presents promising opportunities for further strengthening scientific foundations.

Current reforms—such as updated secondary education standards, new school structures, specialized learning tracks, and modern assessment systems—create favorable conditions for expanding innovation-pedagogical research. Ongoing enhancement of methodological completeness and systemic approaches in implementing these innovations is expected to contribute significantly to the effective development and sustainable renewal of the educational sphere.

Thus, there is a growing need for a new theoretical understanding of the essence of managing innovation processes in educational institutions and for the development of pedagogical conditions that ensure continuous innovative progress. Equally important is the fact that innovation processes require specialized personnel training—teachers and education managers competent in the field of pedagogical innovations.

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Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2025. № 12

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