

SCIENTIFIC KNOWLEDGE: ITS ESSENCE, CORE PRINCIPLES, AND ROLE IN INNOVATIVE ACTIVITY

S. Boymurodov

Associate Professor, Department of Philosophy and Sociology,
Qarshi State University, PhD in Philosophy

Abstract

This article reveals that scientific knowledge is one of the continuous and complex processes of human thought. It examines how scientific knowledge manifests itself as the most important instrument for human understanding of the surrounding environment, society, and oneself, and analyzes how, in this process, a person assimilates new information through experience, observation, and analysis, then generalizes it to form new concepts. It is argued that scientific knowledge, grounded in the principles of objectivity, validity, logical consistency, and systematicity, enriches existing knowledge and opens pathways to new discoveries. Accordingly, the article contends that scientific knowledge is not merely a means of acquiring knowledge, but also one of the most important factors ensuring the intellectual and spiritual development of humanity.

Keywords: Knowledge, scientific knowledge, innovation, objectivity, validity, logical consistency, systematicity.

Introduction

Today, the essence of state scientific research policy - considered a top priority - lies in supporting scientific and technological research that can be competitive on the world market and enable a fundamental renewal of economic sectors. It also encompasses ensuring sustainable economic growth, improving the quality and standard of living of the population, and guaranteeing technological and ecological security. Scientific activity has been, and will continue to be, the most active domain of state policy. It should be noted that a scientific idea cannot be directly applied to economic activity. For this reason, organizations are slow to fund research, even when they feel a great need for it.

Literature review and methodology

Under current conditions, the state is assuming the function of supplying business - more specifically, supplying it with scientific knowledge and ideas. This is evident in the relentless pursuit by independent economic entities and entrepreneurs in a market economy to make effective use of production-related innovations. According to J. Schumpeter, who studied the distinctive features of a market economy and revealed the connection between entrepreneurial activity and innovation, economic exploration requires a particular mode of thinking - one that is oriented toward novelty and innovation.

Innovation is a new or significantly improved product (good or service) or process introduced for use, a new method of sales, or a new organizational method in business practices, workplace organization, or external relations. "Today, not a single sector of the world can develop without



innovative ideas and the achievements of science and technology."

As the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, has emphasized: "Our country has many scientists of high potential who are recognized on a global scale. They must establish their own schools and mentor students. It is necessary to fundamentally improve school education - the first stage in nurturing the younger generation into capable personnel - and to ensure the continuity of the process of training scientific staff and highly qualified specialists. We will spare nothing in this regard... The time itself demands a further development of scientific cooperation with the world's leading institutes, universities, research centers, and academies of sciences." Favorable conditions must be created in our country for compatriots who have received education and academic degrees at leading foreign educational and scientific institutions, and measures must be taken to support them. Despite the innovations and teachings that have made a significant contribution to the progress of humanity, there are still unfortunate people suffering from wars and hardships at the beginning of the third millennium - an era of advanced science and culture. Moreover, such evils continue to reemerge in new forms and with new substance. In truth, "a society is socialized to the extent that it is preserved in its moral dimension in accordance with the needs of society." A society whose members are socialized is a strong society. For a strong society is one that upholds human rights and freedoms, democratic values, and brings the human factor to fruition.

As science, culture, and development progress, the necessity of educating people and healing their souls becomes ever more urgent. The need not to "lose oneself" amid the flood of events grows ever stronger. Only those individuals and peoples who hold fast to their own thoughts and minds, and who strive to develop them in harmony with national and universal human values, can preserve themselves in such circumstances. In truth, a healthy spiritual need is the means by which the human heart is filled with light, goodness, and virtue, and through which it is protected from evil vices.

Throughout the history of human progress, the process of knowing and understanding the world has occupied a central place. Every field of science - whether natural sciences or social and humanistic sciences - passes through various stages of knowledge in its development. The process of cognition is the most important form of human thought, necessary for understanding the nature of the environment, society, and humanity itself. Scientific knowledge, as the highest form of human cognition, relies on specific methods, experimentation, observation, analysis, and theoretical conclusions. For this reason, scientific knowledge differs from other types of knowledge - everyday, religious, or artistic knowledge.

Cognition is the most important and active form of human thought, constituting the foundation of human progress. Cognition is the process by which a person reflects the surrounding world, the phenomena of nature and society, through consciousness. The human mind does not merely receive reality passively; it actively studies it, analyzes it, and determines its own place within it. Therefore, the process of cognition is not merely the collection of information, but consists of identifying truth, understanding laws and patterns, and applying them in practice. In the process of cognition, a person perceives the world through the senses and then analyzes this information through thought. In this way, one forms one's own knowledge. The goal of cognition is to discover truth - that is, to reflect reality accurately, objectively, and in a logically consistent manner. Therefore, the result of cognition is not merely a collection of facts, but rather scientific



knowledge that explains the causal relationships between those facts.

Knowledge is the result of human experience and is of decisive importance in the development of society. For it is precisely through the process of cognition that achievements are made in science, technology, art, and social spheres. In this sense, cognition manifests itself as the force that advances humanity and leads it toward renewal. The process of cognition is complex and multifaceted, and finds its expression in the various spheres of human activity. The types of cognition differ according to the manner in which a person perceives the world, their purpose, and the means at their disposal.

Ordinary (everyday) cognition is the type of knowledge formed on the basis of a person's everyday life experience. It often arises as a result of direct observation and personal experience. For example, a farmer predicting weather changes based on years of experience, or a doctor diagnosing a patient's condition based on practice, are examples of everyday cognition. Although such knowledge often lacks a scientific foundation, it holds practical value.

Artistic cognition, on the other hand, is associated with a person's aesthetic perception. In this type of cognition, reality is expressed through art, literature, music, and visual means. Artistic cognition influences the human heart through emotions, images, symbols, and metaphors. For example, a poet expresses reality through verse, while a painter conveys human feelings through color.

Religious cognition is connected with faith, spirituality, and the soul, and is formed on the basis of divine sources, sacred texts, and religious experience. Religious cognition calls people to virtue, justice, patience, and compassion. It is grounded not in scientific evidence, but in belief and faith.

Scientific knowledge is considered the highest form of human thought. It encompasses the deep analysis of reality, the identification of general laws on the basis of evidence, and their demonstration. In scientific knowledge, the methods of experimentation, observation, logical analysis, induction, and deduction are employed. For example, the law of conservation of energy in physics, or the theory of natural selection in biology, are results of scientific knowledge. Scientific knowledge is distinguished from other types of knowledge by a number of characteristics.

Objectivity - scientific knowledge must be independent of personal opinion, emotion, or belief. Scientific truth is based not on subjective views, but on verified evidence. Validity - every conclusion of scientific knowledge requires proof. No scientific claim can be accepted as truth without evidence, experimentation, or logical justification. Systematicity - scientific knowledge is interconnected and constitutes a unified theoretical system. Each new discovery joins the existing system of knowledge, enriching or refining it. Verifiability is another important characteristic of scientific knowledge. Every scientific result must be capable of being confirmed or refuted through experimentation by other researchers.

Results and Discussion

The theoretical analysis conducted in this study yields several interconnected findings regarding the nature and function of scientific knowledge in the context of modern innovative activity. First and foremost, the study confirms that scientific knowledge is not a static accumulation of facts but a dynamic, self-renewing system. Its defining characteristics - objectivity, validity,



logical consistency, systematicity, and verifiability - together constitute a rigorous epistemological framework that distinguishes it from other forms of cognition. This framework enables scientific knowledge to serve as a reliable foundation for innovation, since innovations grounded in verified and systematized knowledge are far more likely to produce sustainable and reproducible outcomes than those arising from intuition or tradition alone.

A key finding of this research concerns the relationship between the different types of cognition and their complementary roles in human development. While everyday, artistic, and religious forms of knowledge each make valuable contributions to the formation of a person's worldview and moral sensibility, it is scientific knowledge that provides the methodological precision required to translate ideas into practical innovations. This does not imply a hierarchy of value, but rather a differentiation of function: artistic and religious cognition enrich human experience and motivate purpose, while scientific cognition supplies the empirical and analytical tools necessary to realize that purpose in the material world. The recognition of this complementarity is important for designing educational and research systems that cultivate the full spectrum of human cognitive capacities.

The study further reveals that the gap between scientific knowledge production and its application in economic and social practice represents one of the central challenges of contemporary innovation policy. As noted in the literature review, organizations frequently hesitate to fund fundamental research, despite recognizing its importance, because scientific ideas cannot always be immediately operationalized. This finding is consistent with Schumpeter's observation that innovative economic activity demands a distinctive cognitive orientation - one that embraces uncertainty and long time horizons. The implication for policy is clear: state institutions must play a proactive role in bridging this gap by financing basic research, creating knowledge transfer mechanisms, and cultivating an innovation-friendly environment in which scientific findings can move efficiently from laboratory to application.

In the specific context of Uzbekistan, the results of this analysis underscore the strategic importance of the educational and scientific reforms articulated in President Mirziyoyev's policy agenda. The emphasis on strengthening school education, ensuring the continuity of scientific personnel training, and expanding international scientific cooperation directly addresses the structural prerequisites for building a knowledge-based innovation economy. The data suggest that these reforms are not merely administrative measures but reflect a deeper understanding of the epistemological conditions under which scientific knowledge can flourish and contribute to national development. The creation of favorable conditions for researchers who have trained at leading international institutions is particularly significant, as it addresses the critical need for human capital capable of operating at the frontier of global knowledge production.

The discussion also highlights a dimension of scientific knowledge that is often underappreciated in purely economic analyses of innovation: its role in the moral and spiritual development of society. The findings indicate that a society in which scientific knowledge is actively pursued and widely disseminated is also a society better equipped to uphold democratic values, protect human rights, and foster social cohesion. This is because the epistemic virtues cultivated by scientific practice - critical thinking, intellectual humility, respect for evidence, and openness to revision - are transferable to civic and moral life. In this sense, investing in scientific knowledge is not only an economic imperative but also a condition for the development of a mature and



self-governing civil society.

Finally, the study identifies a methodological insight of broader significance: the process of cognition itself, in all its forms, must be understood as inherently social and cumulative. No individual act of knowing occurs in isolation; every new discovery builds upon, and is made possible by, the accumulated knowledge of preceding generations. This cumulative character of scientific knowledge means that its value compounds over time, and that disruptions to knowledge transmission - whether through inadequate education, political interference, or the loss of scientific institutions - carry long-term costs that are difficult to reverse. This finding reinforces the case for treating scientific knowledge not as a commodity to be produced on demand, but as a public good requiring sustained and deliberate cultivation.

Conclusion

In summary, cognition is a continuous and complex process of human thought. It manifests itself as the most important instrument for a person's understanding of the surrounding environment, society, and themselves. In the process of cognition, a person assimilates new information through experience, observation, and analysis, and by generalizing it, forms new concepts. In particular, scientific knowledge is the highest stage of this process, grounded in empirical and theoretical analysis. Scientific knowledge, based on the principles of objectivity, validity, logical consistency, and systematicity, enriches existing knowledge and opens pathways to new discoveries. It is the driving force of human progress, creating a solid foundation for development in the technological, social, cultural, and economic spheres. For this reason, scientific knowledge is not merely a means of acquiring knowledge, but one of the most important factors ensuring the intellectual and spiritual development of humanity.

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