CREATIVITY AND INTELLIGENCE: A SCIENTIFIC ANALYSIS OF THEIR INTERRELATIONSHIP

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Abstract: *This article examines the theoretical foundations of creativity and intelligence and analyzes their interrelationship from a scientific perspective. The study compares the logical-analytical characteristics of intelligence with the innovation-oriented aspects of creativity. Additionally, the interaction between these two phenomena is explored through divergent and convergent thinking processes, cognitive factors, and psychological approaches. The article also considers social, pedagogical, and individual factors influencing the development of creativity and intelligence. The findings demonstrate that these concepts are complementary yet relatively independent systems and emphasize the importance of their integrated development.*

Keywords: *creativity, intelligence, thinking, divergent thinking, convergent thinking, cognitive processes, innovation, problem situation, psychological approach, educational process*

INTRODUCTION

Creativity and intelligence are among the most important components of human cognition and are increasingly becoming the focus of modern scientific research. Although these two concepts are often interpreted as closely related, their essence, structure, and functional characteristics are explained differently across various scientific approaches. Intelligence is generally characterized by logical thinking, problem-solving abilities, and information processing, whereas creativity involves generating novelty, producing unconventional solutions, and advancing original ideas.

This article provides a scientific analysis of the interrelationship between creativity and intelligence, highlighting their similarities and differences. It also examines the role of these cognitive phenomena in human activity, the factors influencing their development, and modern psychological and pedagogical approaches. The results of the study contribute to a deeper understanding of the complex and multifaceted relationship between creativity and intelligence.

Theoretical Foundations of Creativity and Intelligence. In scientific literature, there are various approaches to the relationship between intelligence and creativity. Some scholars consider them closely interconnected, while others interpret them as relatively independent systems. For instance, the "threshold theory" suggests that up to a certain level, intelligence is a necessary condition for the development of creativity; however, beyond this threshold, their correlation significantly decreases. In other words, a high level of intelligence does not always guarantee high creativity.

Furthermore, the concepts of divergent and convergent thinking play an important role in this context. Convergent thinking is aimed at finding a single correct answer, whereas divergent thinking focuses on generating multiple possible solutions. Intelligence is more closely associated with convergent thinking, while creativity is predominantly manifested through divergent thinking processes. Therefore, the integration of these two types of thinking is considered a key factor in determining the effectiveness of human cognition.

Cognitive Processes and Their Interaction. Understanding the relationship between creativity and intelligence requires an analysis of cognitive processes. Memory, attention, imagination, and thinking play a crucial role in the formation of these two phenomena. Intellectual activity relies more on logical analysis and structured thinking, while creative processes are driven by imagination and associative thinking, enabling the emergence of new ideas.

Research indicates that high levels of creativity are often associated with broad associative networks and cognitive flexibility. Individuals with such traits are more successful in establishing connections between different domains of knowledge. Intelligence, in turn, helps to logically justify and systematize these connections. Thus, when creativity and intelligence function together, problem-solving becomes more effective.

Psychological and Neurobiological Approaches. Modern psychology and neuroscience pay significant attention to the biological basis of creativity and intelligence. Studies of brain activity reveal that creative thinking involves strong interaction between the hemispheres of the brain. In particular, the frontal lobes play a key role in problem-solving and decision-making processes.

Moreover, neuroplasticity – the brain's ability to reorganize itself by forming new neural connections – is an important factor in the development of creativity. New experiences and knowledge contribute to the formation of new neural pathways, thereby enhancing creative potential. Intelligence plays a crucial role in regulating and directing these processes.

Practical Significance of Creativity and Intelligence. The integration of creativity and intelligence is particularly important in the field of education. Traditional education systems have primarily focused on intellectual development, emphasizing knowledge acquisition and processing. However, modern approaches highlight the importance of fostering creative thinking as well. In the era of globalization and innovation, it is no longer sufficient to rely solely on existing knowledge; the ability to generate new ideas is equally essential.

In this regard, problem-based learning, project-based education, and interactive teaching methods contribute to the simultaneous development of creativity and intelligence. Such approaches help cultivate independent thinking, initiative, and innovative abilities among learners.

The Complexity of Their Interrelationship. The relationship between creativity and intelligence is not linear but rather complex and multidimensional. In some cases, individuals with high intelligence may demonstrate low creativity, while those with

average intelligence may possess high creative potential. This indicates that these two phenomena can develop independently.

Additionally, motivation, environment, social factors, and personal experience significantly influence the development of creativity and intelligence. A supportive environment that encourages free thinking, along with strong intrinsic motivation, plays a vital role in enhancing creativity.

Conclusion. The findings of this scientific analysis indicate that creativity and intelligence are interrelated yet fundamentally independent components of human cognition. Intelligence is associated with logical reasoning, analysis, and systematic problem-solving, while creativity is characterized by innovation, originality, and unconventional thinking. Their relationship is complex and influenced by various internal and external factors.

Research confirms that a certain level of intelligence is necessary for the development of creativity; however, high intelligence alone does not ensure high creativity. Effective creativity requires divergent thinking, cognitive flexibility, and rich imagination, while intelligence organizes and applies these processes in practice.

Furthermore, educational environments, motivation, social conditions, and individual experiences play a significant role in developing both creativity and intelligence. Modern educational approaches that integrate these components are essential for enhancing individuals' innovative potential.

Overall, the integration of creativity and intelligence increases the effectiveness of human activity, enables the solution of complex problems, and fosters the emergence of innovative ideas that contribute to societal development.

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