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GIFTEDNESS AS A PARADIGM OF MODERN PEDAGOGICAL THEORY AND PRACTICE

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Giftedness is understood as a fundamental concept (paradigm) of modern education. It is proven that a child under the age of 5-6, as a predominantly right-hemisphere human being with a plastic psyche, vast emotional-sensory resources, highly dynamic mental processes, and metabolism, is a multifaceted gifted human being. Giftedness, as an emergent essence (arising, according to a synergetic view of the issue, as a systemic property of the whole), can be "unlocked" and actualized through certain educational/developmental procedures.

In this context, it is appropriate to discuss the "basic genius" of each child, which researchers refer to as the "principle of sacredness", inherent in every child enabling them to pursue great goals in life. The realization of this principle largely depends on the structure and content of the socio-pedagogical environment in which the child exists. Accordingly, the "release" of a child's sacred potential (child's genius potentiality) in adulthood may occur under critical life conditions/situations.

It has been determined that giftedness, in some sense, is related to such characteristics as genius, creativity, talent, and others, which can be differentiated in the context of the dichotomy "actual-present" (present situation) – "potential-possible" (prospective).

Childhood itself can positively influence an adult person capable of activating this state. In this regard, we refer to the methodology of infantilization as a psychologically positive regression into childhood, which significantly enhances the educational process.

It is concluded that developmental-pedagogical impact on the neural structure of the human brain can leave imprints on the genetic structures of an individual, potentially transmitting these effects to future generations through inheritance.

Keywords: *giftedness, genius, creativity, talent, intelligence, infantilization methodology, epigenetic inheritance, pedagogical fact, principle of sacredness, biological time.*

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ОБДАРОВАНІСТЬ ЯК ПАРАДИГМА СУЧАСНОЇ ПЕДАГОГІЧНОЇ ТЕОРІЇ І ПРАКТИКИ

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Обдарованість розуміється як фундаментальний концепт (парадигма) сучасної освіти. Робиться висновок, що дитина до 5-6 років як переважно правопівкульова істота з її пластичною психікою, величезними емоційно-сензитивними ресурсами дитячого організму, з високою динамікою її психічних процесів, а також метаболізму, постає багатогранно обдарованою істотою. При цьому обдарованість як емерджентну сутність (що постає, згідно з синергетичним поглядом на зазначену проблему, системною властивістю цілого) можна "вивільняти", актуалізувати завдяки певним освітнім/розвивальним процедурам.

У цьому контексті доцільно говорити про "базальну геніальність" кожної дитини, яку дослідники називають "принципом сакральності", що притаманна кожній дитині і реалізує її потребу щодо досягнення великих цілей у своєму житті. Реалізація принципу сакральності багато в чому залежить від структури та змісту соціально-педагогічного середовища, в якому знаходиться дитина. Відповідно, "вивільнення" дитячого комплексу сакральності (дитячої геніальності) в дорослої людини може мати місце у критичних умовах/ситуаціях життєдіяльності.

З'ясовано, що обдарованість, у певному розумінні, пов'язана з такими характеристиками людини, як геніальність, креативність, талановитість та ін., які можна диференціювати у ракурсі дихотомії "актуально-дійсне" (наявне) – "потенційно-можливе" (перспективне).

Стан дитинства може позитивно впливати на дорослу людину, здатну активізувати цей стан. У зв'язку з цим можна говорити про методику інфантелізації, як психологічно позитивний регрес у дитячий вік, що дозволяє значно активізувати освітній процес.

Робиться висновок про розвивально-педагогічний вплив виховання на нейронну структуру людського мозку, і результати цього впливу можуть бути "закарбовані" у генетичних структурах людини, що на рівні спадковості може передаватися майбутнім генераціям людей.

Ключові слова: *обдарованість, геніальність, креативність, талановитість, інтелект, методика інфантелізації, епігенетична спадковість, педагогічний факт, принцип сакральності, біологічний час.*

Introduction of the issue. The development of future civilizations can be ensured by the personalites with clearly expressed needs for exploration, risk-taking, freedom, and responsibility. Under these conditions, the way of life of gifted children should prioritize the higher needs as an alternative to the dominance of hedonism and consumerism. The phenomenon of giftedness has a historical aspect, depending on the lifestyle and societal demands placed on gifted individuals. In modern civilization with its crisis of personality, the rise of technocratic thinking, and the necessity to counter negative phenomena, the criteria for giftedness have undergone changes. Qualities of gifted personality that enable them to realize their potential, unfold creativity, and ultimately improve the social environment and interpersonal relationships are now prioritized.

Developed spirituality is, evidently, one of the key societal demands for gifted individuals capable of addressing current issues of social life. Gifted individuals are guardians of beauty and harmony in culture and nature who defend rather than destroy. They are characterized by an open personality stance, which includes a positive attitude toward themselves and the world, a suprapersonal system of values, selfless interest in the world and others, and non-pragmatic motivation for activity. This open personality stance, connected to such qualities such as activity, freedom, self-transcendence, and spirituality, serves as a factor of giftedness, creating prerequisites for the realization of cognitive and other abilities through a superpersonal orientation of interests and a profound curiosity about the phenomena of the world.

Current state of the issue. Analysis of the modern socio-cultural situation shows that giftedness, as well as creativity, are becoming key categories of modern psychological and pedagogical science aimed at revealing the fundamental foundations of educational activity. This, in turn, leads to a deepening of research into the problems of giftedness, intellectual and creative development of young people, which is embodied in the research direction concerning the understanding of the psychological foundations and structure of giftedness and intelligence: in foreign sources – J.P. Guilford, C. Perleth, B.F. Skinner, E.P. Torrance and others [16], in Ukrainian scientific literature – O.Ye. Antonova, V.O. Molyako, V.V. Pavlenko and others [4].

In general, different approaches to the problem of giftedness and the diversity of its models can be discussed [5; 6]. The literature review shows a new direction in studying the phenomenon of giftedness, associated with its paradigmatic meaning. In the scientific explorations of foreign researchers, increasing attention is being paid to the problem of giftedness in the context of its paradigmatic content and its connection to the paradigm shift in modern education [11; 12; 16; 17].

The aim of the research. The purpose of our research is to outline the main aspects of the phenomenon of giftedness in the context of its paradigmatic meaning in the sphere of educational activity.

Research methods. Our interdisciplinary study involved both theoretical analysis of the research problem and traditional methods for conducting a pedagogical experiment. This included the concept of functional asymmetry of the human brain hemispheres and synergetics as an interdisciplinary tool and interdisciplinary reflection for cognizing the world.

Results and discussion. The study of the problem of gifted children allows us to conclude that giftedness can be understood as a fundamental concept (construct, paradigm) of modern education. At the same time, the issue of giftedness has many aspects. On the one hand, some researchers believe that a child's giftedness in a particular area of its life activity inherent in every child.

On the other hand, some scientists argue that not all children are gifted. Giftedness can be considered both an actual characteristic of a child, visible on the surface of its activities, and a potential quality that needs to be "awakened", "freed", "unfolded", expanded, actualized, developed.

While still other researchers believe this process can occur at any stage of a person's life, others argue that giftedness is easier to actualize during special (critical) points or phases in a person's developmental trajectory.

In this context, examples like the "Mowgli children", raised by animals at an early age, illustrate that such individuals, having missed sensitive developmental phases, and being put to a civilized environment, often remained at a primitive level of development. However, even primitive social environments provide subtle informational signals capable of unlocking the child's potential for humanity, which is highly likely to be further developed through specific environmental stimuli. A well-documented case involved a little boy kept by her parents in a closet until the age of six with minimal social interaction. Once released and placed in a civilized environment, he quickly caught up with his peers in development. Another case describes a primitive and nomadic tribe in Paraguay, the Guayqui. J. Vellard, a French ethnographer, found a two-year-old girl abandoned at a campsite. He brought her to France, where she was raised in a modern environment. By age 20, she was indistinguishable in intellect and social integration from educated European women becoming an ethnographer and mastering different languages. It is clear that if a girl who "immersed" in modern human civilization were not 2 years old (when the most intensive process of maturation of the relevant mechanisms of the human psyche takes place), but 8-10, the results of her upbringing would not be so brilliant. Such evidence illustrates the

importance of the potential resources of giftedness inherent in Homo sapiens, which are revealed and developed in suitable social environments. Furthermore, it emphasizes the role of sensitivity phases, or "informational windows", in the development of living/human beings, when they are open to specific environmental influences.

It should be noted that some researchers believe that giftedness is preserved in the mental structure of a person for a long period of his/her life in a "dormant" state; others believe that a person loses the characteristics associated with giftedness with age if they were not demanded by the educational/social system and actualized by this system. In this regard, let us refer to the Japanese proverb (quoted by Masahiro Yokotani), according to which "When you're ten, they call you a prodigy. When you're fifteen, they call you a *genius*. But once you hit *twenty*, you're just a normal *person*" [1].

Under such conditions, giftedness, in a certain sense, is associated with such characteristics of a person as genius, creativity, talent, etc., which can be differentiated in the plane of the dichotomy "actual-existing" (being present) – "potential-possible" (being in the perspective).

Table 1

Correlation of essential human characteristics in the context of the dichotomy "actual-existing" – "potential-possible"

Potential-Possible	**Actual-Existing**
Right-hemisphere psyche	Left-hemisphere psyche
Cyclothymia	Schizothymia
Genetic inheritance	Epigenetic inheritance
Mind	Intelligence
Creativity	Creative artistry
Giftedness	Talent
Talent	Genius
Abilities/skills	Knowledge
Upbringing	Education

The analysis of the problem of children's giftedness proves that a child is a multifaceted gifted individual, having a predominantly right-hemispheric (up to 5-6 years old), a plastic psyche, vast emotional-sensory resources, highly dynamic mental processes, and metabolism. It is possible to "unlock" giftedness, as an emergent entity (a systemic property of the whole, according to the synergetics view of the problem), through specific educational/developmental procedures. The principle of "talent as a synthesis of talents" suggests that various abilities of a child coexist within the psyche in a state of synergetic unity. The development of one talent is facilitated and potentiated through the development of others.

Childhood itself can positively influence an adult person capable of reactivating this state. This was demonstrated in a psychological-pedagogical experiment conducted in 2020 at Zhytomyr Ivan Franko State University. During the first class with first-year students specializing in "performing arts", each of the 14 students was asked to read aloud a short English text with the aim to analyze his/her English language proficiency. Errors in reading were not corrected. After that, the students were asked to imagine themselves as 5-6-year-old children and reread the same text as if they were children. The number of pronunciation errors decreased significantly.

This phenomenon supports the ***method of infantilization*** being a psychologically positive regression into childhood. As noted by S. Palchevskyi, it is common knowledge in educational practice that memorizing large volumes of material often involves physical tension, resulting in a "micro-stress" and vegetative changes in a person's body. In

such a state, learners appear "active", reminiscent of a pre-start position in a race. Classical pedagogy views this as an illustration of traditional principles of active learning. However, the research by the Institute of Suggestology in Sofia (Bulgaria) confirmed that effective memorization may be accompanied by apparent passivity rather than physical tension. Infantilization encourages a relaxed state that facilitates hyper-memory processes [5: 63-65].

In this context, we can mention the phenomenon of ***"basal genius"*** of each child, which A. Maslow described as the ***"principle of sacredness",*** being inherent in all children and manifesting itself as their drive to achieve great goals.

Under such conditions, it is important to note that the "release" of the child's sacredness complex in an adult can occur in critical conditions/life situations. Let us give an example.

In 1939, 25-year-old student George Danzig was studying at the University of California. One day he was 20 minutes late for a statistics lecture. He quietly entered, sat down at his desk, trying to understand what he had missed. The data for two math problems were written on the board. J. Danzig took these conditions as homework for the next class, copying the problems into a notebook. At home, he regretted that he was late for the class, since the problems were very difficult. J. Danzig thought that he must have missed something important for solving them. After several days of hard work, he finally solved these problems. Satisfied with the result achieved, he rushed to the professor and gave him the notebook. The professor, Jerzy Neumann, inattentively accepted the solved problems, he somehow could not immediately remember that he did not give students such problems. When he later reviewed what the student had brought him, he was stunned: he remembered that at the beginning of one of his lectures he had revealed to the students the conditions of these two problems – two unsolvable problems that the outstanding mathematicians of the time could not solve.

This principle of sacredness realization largely depends on the structure and content of the socio-pedagogical environment where the child grows. Let us give an example

In one experiment, the students with average intelligence levels were divided into two groups. One teacher was told that his students were exceptionally intelligent, while the other teacher (with the same level of qualification) was told that his class consisted of low-achievers. At the end of the year, testing showed significantly higher results among the "intelligent" group even though the students initially had the same intellectual level with the students of the second teacher.

In standard psychology courses, R. Rosenthal and K. Fode instructed students to train rats to navigate mazes. Half were told their rats were specially bred for superior problem-solving, while the other half believed their rats were incapable. The "gifted" rats outperformed the "unintelligent" ones, proving how expectations shape results [13: 183-187].

In a genetics experiment described by Y. Gippenreiter in the book "*Introduction to General Psychology*", describes a series of experiments aimed at understanding the connection between environment and heredity. In the experiment, "smart" (successful) and "stupid" (unsuccessful) rats were selected and bred on the basis of quickly finding a bait in a maze of changing configuration. Crossings were carried out within each group, and this procedure was repeated for six generations. As a result of these experiments, convincing evidence was obtained concerning the effect of the accumulation of genetic predisposition to successful learning. However, if the conditions of the experiment were changed, the result also changed: the selected generation of "smart" rats was raised in an impoverished environment, where they were deprived of various impressions and the opportunity to actively act. As a result, it turned out that such rats during training in the maze acted only at the level of "stupid" animals raised in natural conditions. Opposing

experiments with raising "dumb" rats in an enriched environment showed results approximately the same as those of "smart" rats raised in normal conditions.

These studies confirm the importance of upbringing conditions in the formation of abilities. The general conclusion that can be drawn from them is more significant: environmental factors have a weight comparable to hereditary factors, and can sometimes completely compensate for or, conversely, neutralize the effect of the latter.

Based on the aforementioned facts and other studies, we formulated a pedagogical axiom that is part of our developed corpus of pedagogical axioms: *"The educator's perception (and overall personality characteristics) of the object of pedagogical influence can have a decisive impact on the educational process and its outcome"* [2; 3].

Thus, a child in early childhood can be considered a multifaceted (and even genius) gifted being. An example of this can be seen in the history of one Hungarian family.

People who came of age in the 1980s and 1990s might remember the meteoric rise of the Polgar sisters – Zsuzsa, Sofia, and Judit. Not only did they make it into the Guinness World Records, but these once "simple child prodigies" transformed into professional chess grandmasters. These girls boldly competed against male grandmasters and regularly defeated them, proving that female chess players are no less capable than their male counterparts. The upbringing of these prodigies might never have happened without their father, Hungarian educator-psychologist Laszlo Polgar, who set out to prove to the world that raising geniuses is entirely achievable.

This journey began in the mid-1960s when Laszlo Polgar, then a young educator and psychologist, decided to conduct an extraordinary experiment. He aimed to raise children who would become geniuses. To prepare, he thoroughly studied the biographies of great individuals and concluded that with prolonged and meticulous effort, coupled with a high degree of focused dedication, such a goal was entirely feasible. Polgar planned to conduct this experiment on his own children. At the time, however, he was unmarried. To solve this issue, he posted an advertisement in newspapers, openly stating that he was seeking a wife to help him conduct his experiment. His advertisement attracted Clara Altberger, a teacher living in the administrative center of the Zakarpattia region.

After a thorough acquaintance, the two married, and in 1969, their first daughter, Zhuzha, was born. They began the pedagogical experiment when Zhuzha was 3.5 years old. Like any child, Zhuzha explored her parents' cabinets and found a chess set in one of them. Being a professional educator, her father decided to seize the opportunity: he invented a game where the chess pieces became fairy tale characters, effectively substituting dolls with chess pieces for the child.

It should be noted that in the 1970s, chess in Hungary was second only to football in popularity. The father's efforts bore fruit: shortly afterward, Zhuzha won the Budapest Chess Championship for children under 11 years old, despite being only four years old at the time. Her first success inspired her father, who took a bold step and brought her to the city chess club. Initially, the adults did not take the little girl seriously, assuming she was there merely to spend time with her father. However, when she sat down at the board and soon defeated an experienced male player, everyone realized how wrong they had been. For Zhuzha's opponent, the loss was a complete humiliation – he did not even shake her hand and stormed out of the room.

After the birth of two more daughters, Sofia in 1974 and Judit in 1976, the Polgar parents understood that the experiment needed to be taken to an entirely new level. Both parents had to quit their jobs to dedicate all their time to their daughters, who transitioned to homeschooling. This approach differed fundamentally from standard school curricula. For the Polgars, this phase of the experiment proved one of the most challenging. Child welfare authorities

vehemently opposed the parents' decision, even involving the police. However, it was their eldest daughter, Zhuzha, who helped resolve the issue. By the age of 10, she had become a chess master among adults and was defeating renowned grandmasters at 12. As for her academic progress, Zhuzha could read and write fluently by age seven, and her mathematical abilities far exceeded those of her peers.

Within the family, Zhuzha became the third educator, assisting her parents in teaching her younger sisters. Professional chess trainers began to notice her talent. Soon after, the parents received official permission for homeschooling. By the late 1970s, Laszlo Polgar's doctrine for raising geniuses had taken its final form. Each day was structured as follows: a minimum of 4 hours was dedicated to their chosen specialty (chess in this case); 1 hour to language learning, starting with Esperanto, followed by English and other optional languages; 3 hours to general educational subjects; 1 hour to psychology and pedagogy, with humorous breaks every 20 minutes; and 1 hour to physical education.

As a result, the children spent no less than 8 hours per day studying, though this could stretch to 11 hours if needed. Remarkably, the Polgar children completed a year-long curriculum for primary school subjects in just 7-10 days. Critics claimed the parents had confined their children to a "domestic prison", but life proved otherwise. At 12 years old, the eldest Polgar daughter topped the national women's chess rankings. Three years later, she claimed the number one spot in the FIDE rankings. Her tournament winnings supported the family, as her parents did not hold formal jobs. Zhuzha did not stop at her achievements, and in 1990 she became a grandmaster in the men's version of chess. Her pinnacle achievement was winning the title of Women's World Champion in 1996. The younger sisters followed her example. In 1988, they caused a sensation when they participated together in the Women's Chess Olympiad. For the first time in the history of Hungarian women's chess, their family trio secured first place. Twelve-year-old Judit was the true revelation of the Olympiad, earning the title of the best player.

As the sisters grew older, they gradually moved away from official chess competitions, starting their own families. However, they never fully severed ties with their main sport. The youngest sister, Judit, wrote a chess book for children. The middle sister, Sofia, married Georgian grandmaster Iona Kosashvili and moved to Israel. The eldest, Zhuzha, after having two children, briefly stepped away from tournaments but returned when her children grew older. She participated in mass tournaments, facing hundreds of players at a time. For example, in 2005, during one such event, Zhuzha Polgar played against 328 opponents, winning 309 games. The following season, she took part in a chess marathon where, at the age of 37, the former World Champion played 1,131 games in 17 hours.

Thus, this case clearly demonstrates that the experiment of raising genius children, conceived by Laszlo Polgar, was a success. Despite certain challenges, the family managed to nurture extraordinary athletes who not only triumphed in prestigious tournaments but also defeated nearly all prominent male chess players. The youngest sister, Judit, became the youngest grandmaster in the world, surpassing Bobby Fischer's record by one month.

Undoubtedly, Laszlo Polgar himself was a talented or even genius educator, exceptionally consistent in pursuing his goal. He passed his talent to his children within the framework of so-called ***epigenetic inheritance***. In this context, it can be argued that ***human behavior and genetic information are mutually complementary: upbringing influences the genome, and epigenetic changes can be inherited.***

In connection with the indicated type of heredity, we can say that human behavior and genetic information about a person (the human organism) are in a mutually complementary relationship to each

other, when upbringing affects the genome. At the same time, epigenetic changes can be inherited, when the genotype determines not behavior as such, but rather the general principles of building the neural circuits responsible for processing incoming information and making decisions, and these "computing devices" are capable of learning and are constantly rebuilt throughout life.

The absence of a direct and definitive correspondence between genes and behavior does not contradict the fact that specific mutations can alter behavior in a predictable way. A behavioral trait that initially appeared repeatedly as a result of learning can eventually become instinctive (innate), and this change can be "written" into the human genotype [8].

In this light, it can be stated that ***developmental and pedagogical influences on the neural structure of the human brain can leave imprints on genetic structures***. These changes may be passed down to future generations, influencing heredity at the genetic level.

Experimental studies by researchers from the University of California have shown that a person's intention to perform any action not only changes the brain's biochemistry but also alters its size and structure. Mice placed in conditions requiring increased physical activity over several generations developed distinct skeletal and brain structures and exhibited a more intense metabolism compared to their less active counterparts [9; 10; 15].

This finding applies not only to positive but also to negative (stress-induced) changes. Negative events can trigger chemical reactions that fundamentally alter the way the neural networks in the brain interact, thereby reshaping its structure [14].

It should be noted that ***genetic and epigenetic factors can conflict with each other***. To illustrate this conclusion, we can offer a pedagogical fact reported by Robert R. Blake in 1997 in India, which left an unforgettable impression on him. A boy, the son of a shoemaker, was ashamed of his social status. Determined to change his life, he studied diligently. After completing school with honors, he traveled to London to become a lawyer. He worked and studied tirelessly, achieving fame and wealth. Years later, during a vacation, he returned to his parents and, for nostalgia, began helping his father in the workshop. Immersing himself in simple physical labor – hammering nails and repairing soles – he realized he felt truly happy only in his father's workshop. He never returned to London, explaining that this primitive yet fulfilling work brought him genuine contentment.

The potential of unlocking a child's genius can be seen in various contexts, such as through ***initiation-based learning***. This sociocultural phenomenon, often associated with rites of passage, not only signifies social transition but also imparts transformative education to the initiated. Sometimes, initiation involves mystical procedures capable of fundamentally altering the psychological state of the participants, resembling A. Makarenko's "explosion method". Hypnotic states can also significantly enhance intellectual and creative potential. For instance, the research indicates that a novice chess player can drastically improve his/her skills through trance techniques, which are also applicable to other areas of human activity. Suggestopedic and other unconventional/innovative methods, aimed at activating altered states of consciousness, can result in extraordinary abilities. Examples include individuals gaining near-instantaneous calculation abilities (e.g., a farmer struck by lightning developing complex mathematical skills) or becoming polyglots.

One notable case is that of W. Melnikov, a modern polyglot, and another involves an American man, Michael Thomas Boatwright, who inexplicably began speaking Swedish after regaining consciousness. After the incident where sixty-year old Boatwright lost his consciousness, he could only communicate in Swedish with doctors through an interpreter and failed to recognize himself in a mirror. Although he had visited Sweden several times, he was

a U.S. citizen who had spent a decade teaching English in Japan.

Conclusions and research perspectives. Giftedness should be regarded as a paradigm of modern education. A child under the age of 5-6, as a predominantly right-hemispheric being with a plastic psyche, immense emotional-sensory resources, dynamic mental processes, and rapid metabolism, represents a multifaceted gifted human being. Giftedness, understood as an emergent property (a systemic characteristic of the whole, according to the synergetic perspective), can be "unlocked" and actualized through specific developmental/educational procedures.

In this context, one can discuss the concept of "basal genius", inherent in every child, which A. Maslow associates with the "principle of sacredness". This principle aligns with the children's social values and orients them toward higher goals – aspiring to achieve profound values. The realization of this principle depends significantly on the structure and content of the socio-pedagogical environment in which the child lives and develops. The "release" of this sacredness in adulthood often occurs during critical life conditions or situations.

Giftedness correlates with such characteristics as genius, creativity, talent, and wisdom, which can be differentiated through the dichotomy of "actual-existing" (present-oriented) and "potential-possible" (future-oriented).

There is a high possibility that childhood itself positively influences the adult people who are capable of reactivating this state during their life. In this regard, the methodology of infantilization – a psychologically positive regression into childhood – can be used to enhance educational processes significantly.

Analyzing the problem of giftedness and its connection with genetic traits leads us to the conclusion that developmental and pedagogical influences shape the neural structure of the human brain. These effects may be "encoded" into a person's genetic structures and transmitted to future generations through heredity.

In the context of analyzing the problem of giftedness and its connection with human genetic characteristics, a conclusion is made about the developmental and pedagogical impact of upbringing on the neural structure of the human brain, and the results of this impact can be "imprinted" in human genetic structures, which at the level of heredity can be transmitted to future generations of people. The prospective ranges of our research may be focused on further investigation into the interplay between genetics, education, and neural plasticity to support and nurture human potential across generations.

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