Application of the Pattern Method to Form the Stable Neural Structures in the Learning Process as a Way of Solving Modern Problems in Education

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Abstract : The problems of modern education are large-scale and diverse. The aspirations of parents, teachers, and experts converge - everyone interested in growing up a generation of whole, well-educated persons. Both the family and society are expected in the future generation to be self-sufficient, desirable in the labor market, and capable of lifelong learning. Today's children have a powerful potential that is difficult to realize in the conditions of traditional school approaches. Focusing on STEM education in practice often ends with the simple use of computers and gadgets during class. "Science", "technology", "engineering" and "mathematics" are difficult to combine within school and university curricula, which have not changed much during the last 10 years. Solving the problems of modern education largely depends on teachers - innovators, teachers - practitioners who develop and implement effective educational methods and programs. Teachers who propose innovative pedagogical practices that allow students to master large-scale knowledge and apply it to the practical plane. Effective education considers the creation of stable neural structures during the learning process, which allow to preserve and increase knowledge throughout life. The author proposed a method of integrated lessons – cases based on the maths patterns for forming a holistic perception of the world. This method and program are scientifically substantiated and have more than 15 years of practical application experience in school and student classrooms. The first results of the practical application of the author's methodology and curriculum were announced at the International Conference "Teaching and Learning Strategies to Promote Elementary School Success", 2006, April 22-23, Yerevan, Armenia, IREX-administered 2004-2006 Multiple Component Education Project. This program is based on the concept of interdisciplinary connections and its implementation in the process of continuous learning. This allows students to save and increase knowledge throughout life according to a single pattern. The pattern principle stores information on different subjects according to one scheme (pattern), using long-term memory. This is how neural structures are created. The author also admits that a similar method can be successfully applied to the training of artificial intelligence neural networks. However, this assumption requires further research and verification. The educational method and program proposed by the author meet the modern requirements for education, which involves mastering various areas of knowledge, starting from an early age. This approach makes it possible to involve the child's cognitive potential as much as possible and direct it to the preservation and development of individual talents. According to the methodology, at the early stages of learning students understand the connection between school subjects (so-called "sciences" and "humanities") and in real life, apply the knowledge gained in practice. This approach allows students to realize their natural creative abilities and talents, which makes it easier to navigate professional choices and find their place in life.

Keywords : science education, maths education, AI, neuroplasticity, innovative education problem, creativity development, modern education problem