Цифровые образовательные технологии в ближайшие годы станут неотъемлемой частью образования. Поэтому, необходимо развивать данные технологии таким образом, чтобы получать максимальную пользу с минимальным количеством отрицательных составляющих. Возможно ли такое решение, вероятно, покажет практика.

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The phenomenon of mathematical giftedness as the issue of pedagogical psychology

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doi: 10.18411/lj-03-2020-72

idsp: ljjournal-03-2020-72

Аннотация

Статья посвящена математически одаренным детям математическая одаренность и подробно рассмотрены ее составляющие. Представлены проблемы, возникающие с одаренными детьми, на которые следует обратить внимание педагогам и родителям.

Ключевые слова: одаренность, математически одаренные дети, математическое образование, асинхронное развитие, социальное признание, проблемы самообучения.

Abstract

The article is devoted to mathematically gifted children Mathematical giftedness and its components are considered in details. The problems that arise with gifted children, which should be paid attention to teachers and parents, are presented.

Keywords: giftedness, mathematical gifted children, mathematics education, asynchronous development, social recognition, self-learning problems, twice-exceptional children.

The understanding of talent and giftedness has always been far from clear. The idea of giftedness is influenced by cultural and historical conditions: social structure, social values, social ideology, social stereotypes, as well as scientific views and concepts. Every society defines giftedness according to its needs, so its understanding varies with time and place. According to it, the concepts of giftedness will change depending on the changes in society and its needs.

There are many definitions of giftedness. In the “Working Concept of Giftedness”, on which most scientists in Russia rely on, the following definition of giftedness is formulated as follows: “Giftedness is a systemic quality of the psyche that develops over the course of life, which determines the possibility of a person achieving higher, extraordinary results in one or more activities in comparison with other people” [8, p.7]. The abundance of definitions and theories is largely due to the complexity and versatility of the phenomenon of giftedness and the inability to describe it with the help of several features. Many theories of giftedness are “local” and clearly applied in nature. Its study outside the general psychological approach

leads not only to limitation of the analyzed phenomena by a narrow framework of applied tasks, but eventually to the separation of the psychology of giftedness from other psychological directions. This prevents the identification of the main patterns and mechanisms of the emergence and development of giftedness [2, 4].

The issue of the development of mathematical giftedness has recently become relevant. It is one of the most important in the concept of development of mathematics education, approved by the government of the Russian Federation in December 2013. This issue has attracted the attention of scientists, mathematicians, teachers and psychologists for a long time, but a single point of view on this issue has not been developed yet, even at the level of definitions [10].

The problem of mathematical giftedness generates from the general theory of abilities. Russian and foreign scientists devoted a lot of research to this theory. Despite the diversity of views on the essence of mathematical abilities, they have much in common, namely it is essential to distinguish between the usual "school" abilities to assimilate mathematical knowledge, to their reproduction and independent application, and creative mathematical abilities associated with the independent creation of an original and socially valuable product [1, 6, 7].

A.N. Kolmogorov referred to mathematical abilities the following:

- the ability of skillful transformation of literal expressions, discovering good ways to solve equations that do not fit the standard rules, or, as mathematicians call it, "computational or algorithmic abilities";
- geometric imagination, or "geometric intuition";
- the art of serial correctly disjointed logical reasoning [3];

V. A. Krutetskii proposed the following scheme of the structure of mathematical abilities at school age:

1. Obtaining mathematical information: the ability to perceive mathematical material, encompassing the formal structure of the problem.
2. Processing of mathematical information: the ability to logical thinking, the ability to think by mathematical symbols, the ability to generalize quickly and widely, the ability to think by folded structures, flexibility of thinking processes in mathematical activity, the desire for clarity and simplicity, economy and rationality of problem solving, the ability to quick and free rearranging the thinking process, and switching from direct to reverse course of thought.
3. Storage of mathematical information: mathematical memory (generalized memory for mathematical operations, typical relations, methods of solving problems and principles of approach to them);
4. General synthetic component: mathematical orientation of the mind [5].

The selected components are closely related, affect each other and form a single system, a complete structure, a kind of syndrome of mathematical giftedness, a mathematical mindset. Thus, mathematical abilities should be understood as special abilities that are necessary for the successful performance of mathematical activity. Mathematical abilities are not a single entity, but have a complex multi-faceted structure. The success of mathematical activity depends not on a single ability, but on a set of abilities.

The systematic solution of creative, non-standard problems contributes to the formation and improvement of the logic of thought, reasoning, flexibility of the thinking process, ingenuity, creativity of mathematical thinking. Non-standard problems are just good material for the development of mathematical giftedness. According to M. A. Rodionov, it is efficient to develop the mathematical giftedness of schoolchildren on the basis of mastering heuristic methods and methods of solving creative problems. The essence of heuristic methods is that the teacher involves students in the process of "discovery" of various facts, independent formulation of theorems, implementation of individual stages of research.

Nowadays, a number of systems or sets of heuristic techniques have been developed by Russian and foreign scientists [9].

At the same time, scientists confirm that a combination of internal and situational factors can cause problems for mathematically gifted children.

Asynchronous development in gifted children. A common problem for gifted children is asynchronous development, i.e. uneven intellectual, emotional, social and physical development.

The importance of social recognition. In the absence of understanding and support, gifted children may be very different from their peers and may face negative reactions in situations where conformity is valued. Many learn to disguise their abilities in order to alleviate their social problems, especially in those areas where mathematical knowledge is not valued [12]. This can prevent further development of their unique abilities, as well as lead to a loss of self-esteem. However, the review of the literature has shown that gifted children excel not only intellectually, but also physically, emotionally and socially [11].

Self-learning problems. Gifted children often tend to learn on their own and are tempted to use new methods to solve problems that may be beyond their current abilities, making a large number of mistakes and disappointments. Without assistance, these children can suppress their ambitions, develop a fear of making mistakes and reduce productive risky behavior [13].

Twice-Exceptional children. These children have a gift or exceptional ability in one or more areas combined with special needs, learning disabilities, or disabilities in other areas. These children represent a category among the gifted that is particularly at risk. Self-esteem problems are often disproportionately high in children with learning disabilities or marked asynchronous development, as they tend to judge themselves by what they cannot do rather than what they can. This problem is somewhat relieved by sharing assessments of their abilities with them so that they develop more appropriate levels of self-esteem [14].

Thus, it is essential to distinguish between mathematical abilities and creative attitude to study mathematics. All kinds of creative activities are of great importance for gifted children in the field of mathematics; the more creative and more diverse these activities are, the more likely it is that a gifted child will find a creative approach to mathematical problems.

The characteristics and needs of different groups of gifted children are very different; they need different support programs; the system of activities is closely connected to the main activities of talented and initiative children.

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University Rankings as an Education Policy Tool

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doi: 10.18411/lj-03-2020-73

idsp: ljjournal-03-2020-73

Аннотация

Данная статья посвящена проблеме университетских рейтингов как инструмента регулирования национальной образовательной политики, определяемой воздействием как глобальных, так и локальных процессов. Дается литературный обзор по проблеме рейтингов с акцентом на их отрицательные эффекты. В статье утверждается, что проведение образовательной политики с ориентацией на глобальные университетские рейтинги может вести к негативным последствиям для национальной образовательной системы, в частности, той системы, которая изначально основана на усиленном государственном регулировании.

Ключевые слова: рейтинги университетов, образовательная политика, глобализация, высшее образование.

Abstract

The article deals with the problem of university rankings as a tool for regulating national higher education policy, which is shaped by both local and global processes. The article gives a literature review on university rankings with a specific focus on their downsides. The article argues that excessive implementation of ranking-oriented policy may result in negative consequences for a national educational system especially the one based on strong state regulation.

Keywords: university rankings, education policy, globalisation, higher education.

The traditional approach to education had a tilt towards planning which comprised policy as its key element [8, p. 17]. However, later research into the subject matter focused on policy as a broader concept. From this perspective, national education policy serves to establish the major goals and priorities the government sets, whereas strategy tends to specify the ways of target achievement, and planning aims to lay out concrete actions as well as the timeline and resources [23, p. 6].

Since education policy is carried out in the era of change, it is appropriate to conceptualise policy in terms of what Wittrock and de Leon once defined as a ‘moving target’ [24, p. 136]. Their assumptions about the alterability of policy in changing contexts are topical today. The Bologna process, as Neave & Maasen point out, may serve as a good example of such a context, or process [18, p.138]. Its dynamics are still underpinned by difference in speed, that of the intergovernmental stakeholders and that of concrete national higher educational institutions (HEIs) whose visions may not be the same for a number of social, cultural and political reasons.

This gives implications about the nature of higher education (HE) policy of a country. On the one hand, it is shaped by global tendencies, such as competition, quality assurance, performance evaluation, and others [13, p. 20]. On the other hand, it is determined by values,