Academic competitions and Technology Olympiads as a means to identify and develop endowments of school students

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Abstract. The article investigates the problems linked to the issues of finding out, developing and supporting of the endowments of children and adolescents. The authors offer a range of criteria to determine the types of endowments which are determined as an integral and a multisided phenomenon. The complex structure of the concept singles out inclination to labor as the primary factor of the endowments. This article introduces the experience of conducting competitions and technology Olympiads for the students of general education institutions, which are, according to the authors, is the efficient means to identification and development of the endowments of the children and adolescents.

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Introduction

During the past decades the Russian pedagogy and psychology shows a sustainable interest in the issue of the endowments of children and adolescents. The problem of the identification of the gifted children and their development peculiarities is the main area in the studies of this field is.

At different period of times the issues of nature, structure and types of the endowments were topical in the works of D.B. Bogoyavlensky, U.Z. Gilbukh, N.S. Laytes, A.M. Matushkina, A.A. Melik – Pashaeva, V.D. Shadrikova etc. The works of U.B. Babaeva, A.I. Savenkova, E.L. Yakovleva examine the peculiarities in the identification, education and development of the gifted children in general education institutions and institutions of additional education. The problems of endowments identification are enlightened in the works of the both Russian [1-3], and foreign researches [4-7].

Main part

By the endowments it is usually meant this characterizing feature of psychology which determines the capacity for being a high achiever in different fields. Therefore, a gifted child is a child who can achieve bright and even remarkable results (or has the potential for such achievements) in this or that field.

The issue of the endowments is investigated in science from different sides: philosophical, biological, psychological and pedagogical. Philosophers examine the endowments of human beings in the frameworks of the general problem which is the problem of peoples' aptitudes realization. Biology considers this problem as the genetic problem, ranking the first the scientific aspects of the gifted person development. Psychology focuses on the analysis of psyche and aptitudes for creativity. Pedagogical concepts link demonstration and development of human beings' endowments with the specific conditions for the development provided by the education and by the social and cultural environment. For instance, according to the conception of the American researcher J. Renzulli the endowments are the combination of the 3 characterizing features: intelligence (which is higher than average), creativity and persistence (motivation, aimed at task-solving) [9]. He says that gifted children are those children who leave behind their peers in at least one of these parameters. In addition to this, this concept takes into account knowledge (erudition) and favorable conditions [2].

Some researchers [2, 10] examine the endowments as a characterizing feature which changes dynamically. They view the endowments not as the static (a feature of a personality) but as the constantly developing potential of human beings. Here we can single out the problem of the endowments development or, in other words, the problem of the individual potential development of every child. This aspect is very useful in pedagogy, thus it is examined thoroughly in the works on pedagogy.

The development of the endowments is always the result of the complex interaction of heredity (natural faculties) and social environment, mediated by the activity of the children (games, labor and studies). The specific role is given to the individual activities of the children as well as to the psychological mechanisms of the personality

development which are underlying in the process of the forming and realizing the endowments.

Therefore, endowments represent both a multisided and an integral phenomenon. A gifted child should have specific genetic aptitudes, but, simultaneously, his environment (his family, school and peers) should promote the development of his personal traits.

The variety of the endowments, their dependence on age, arrangement of the academic process at school and specific features of the upbringing in families resulted in the following definition of the types of endowments [11]:

– as to the scale of the aptitudes demonstration – general and specific endowments;

– as to the type of the preferable activities – intellectual, academic, creative, artistic, psychomotor (for sports), engineering, leadership skills (organizing skills), etc.

– as to the type of demonstration – apparent and latent (not demonstrated yet);

– as to the extent of the development: potential and actual;

– as to the age-related demonstration – early and late;

V.I. Panov adds up the criterion of the "intensity of the demonstration" ti the criteria listed before [12]. According to him, by the intensity of the endowments demonstration we can define children who show high readiness to the studies; gifted children, children of great abilities, exceptionally gifted children and children with distinctive abilities (talented children and child prodigies).

All gifted children have personal traits which distinguish those children from their so-called "normal" peers. The researches of this problem sings out different specific features of the gifted children. For instance, U.Z. Gilbukh defines the following traits: early demonstration of a high cognitive activity and intellectual curiosity, agility and accuracy of the intellectual activity, developed logical reasoning, an expressive vocabulary, agility and originality of the verbal associations, a clear orientation toward creative fulfillment of the tasks, a good development of creative thinking and imagination, ability to learn and study basic things [13].

The German specialist in the training of the gifted children K.A. Kheller defines the following personal traits of these children: high intellectual aptitudes, remarkable creative faculties, capacities for speedy learning and tremendous memory, intellectual curiosity and striving for knowledge, high personal responsibility, confidence in personal efficiency and independence in opinions, positive I-conception, related to the normal self-esteem [14].

The works of many Russian researches define the analogue characteristics. For example, A.I. Savenkov includes in the list of the psychological features the following features: cognitive ability, hypersensitivity to the problems, inclination to the divergent tasks, originality and flexibility of the way of thinking, easiness of ideation, ability to anticipate, high level of attention span, excellent memory, social autonomy, inclination to competitions, a good sense of humor etc. [2].

As N.S. Laytes rightly states in his works [15], the inclination of children to labor is a clear factor of their endowments. Gifted but not diligent children are unlikely to develop their endowments comparing to the peers who have the inclination to labor. The researcher says that this factor is workable for adults as well. It is well known that outstanding people are great doers. In fact, the inclination to labor is one of the components of the talent.

The technology lessons more than the other promote the love of children to labor. However, to make the labor inspiring, the reasons for it should be really important for the children. As we see it, it could be possible provided a school student is involved in different projects that result in mental and physical labor which is very creative in its nature.

The experience shows that children are more active and persistent in the creative work if they focus on specific results which are in the form of a product. It can be a tangible object (a product) as well as a product of information (a presentation, a dictionary or a game etc.). Therefore, it becomes clearer to understand a longing desire of children to show the result of their labor to the other people or to present them at the exhibition or in the competition. So it is very important to draw the attention of adults to the attempts of the school students to participate in activities where they could present the results of their actions.

These activities include supra-regional technology competitions for the children of the 5-11th forms conducted by the staff of the engineering and technology faculty of Elabuzsk institute under Kazan Federal University. Competition "Constructive labor of the school children" is traditionally held in autumn whereas such competitions as "the Young good hand" and "The competition in the technical projects" are held in spring as the half-yearly results of the creative activity of the school students. The participants compete in different rounds devoted to theory, practice and creativity. They can prove themselves as experts in different technologies while testing, show their skills in material processing (metal, wood, plastics, cloth etc.) and demonstrate their creative abilities in the presentation of the products.

As the children say, technology competitions are both ones of the most difficult and interesting. They require a thorough preparation and a painstaking work. To rank first in this competition, it is necessary to put more than a little physical and mental effort as well as to use all the potential in creativity. In other words, the child shall have an opportunity to demonstrate his endowments and to develop them. Therefore, the main task of the teacher here is to create all the necessary conditions needed for the child.

The participation of children in competitions, Olympiads and festivals at different levels is the primary issue in the teachers' pedagogical activity in identification and support needed for gifted children and adolescents. It is noteworthy that the Republic of Tatarstan implements the dedicated program "Children of Tatarstan", with one of the tasks being the creation and maintenance of the identification, development and targeted support of the gifted children, as well as keeping the national gene pool of the country, the development of the intellectual and creative abilities of the republic within the framework of the subprogram "Gifted children". The long-term implementation of this program resulted in the higher number of winners and prize winners in All-Russian Olympiads among the school students.

During four years a team of school students from the Republic of Tatarstan has been ranked 1st in Privolzsky Federal district as to the results of the All-Russian Olympiad. The team ranked 4th in the Russian Federation following Moscow, Saint-Petersburg and Moscow region. In 2013 according to the results of the subject Olympiads 15 students in the Republic became winners, 61 – prize winners of the final round of the All-Russian School Olympiad (58 students in 2009, 59 – in 2010, 75 – in 2011, 69 in 2012). In 2013 The Republic of Tatarstan ranked 1st in the regional competition on the subject "Technology". 3 school students out of 18 were specified in the final protocol of the winners and prize winners of the All-Russian School Olympiad. 5 territorial entities of the Russian Federation – Moscow, Krasnodar Krai, the Udmurt Republic, Tomsk and Chelyabinsk regions.

We conducted a questionnaire survey among teachers at the supra-regional technology competition "Constructive work of school students" in 2013 to define the main problems related to the development of the creative endowments of the school students.

The popularity of the competition is undoubted which is proved by the number of the participants and teachers (see Table 1). For the participation in this competition the teachers select the students who show their creative abilities in the technological area – gifted children and adolescents.

Table 1. Number of the participants of the supra-regional technology competition "Creative work of school students" 2009 – 2013

Year	Number of participants			Number of teachers
	Mechanical workers	Support personnel	Total	
2009	24	37	61	56
2010	45	85	130	76
2011	56	143	199	99
2012	33	68	101	70
2013	75	99	174	83

It is noteworthy that the target of the supra-regional competition "Constructive labor of school students" is to stimulate the interest of the students in the field "Technology" as well as the increase in professional competence of the technology teachers and entrepreneurs.

The competition is aimed at identification of the gifted school students and material incentives which are necessary to them as well as investigation of the intellectual and creative abilities of the students who study on the program "Technology".

The questionnaire survey conducted among the teachers, who trained the participants in this competition in 2013, showed that those surveyed (100%) are interested in the endowments development of their students which impacts on the results of their work with the gifted school students. Our long-term observation shows that people who are indifferent to their work are unlikely to be found among teachers. Usually the teachers are very active and creative people who love children.

When asked what methods and ways could develop creative endowments of the school children, 78% of teachers mentioned participation in competitions and technology Olympiads. The same number of the respondents says that it is a project work. 60% of teachers think that it is their scientific and research work whereas 56% of teachers think that it is participation if different exhibitions which could develop creative endowments of the children and adolescents.

However, practice shows that the wish to work with the gifted children is not enough for success; a modern-day teachers should have specific professional competence in this field. 33% of those surveyed gave a negative answer to the question "Do you have the sufficient level of competence for the development of the technology endowments of the pupils?" It demonstrates that there is an actual necessity for the training of the teachers which could promote formation and development of the required professional competence for those teachers who work with gifted children.

During the questionnaire survey we found out what occupations and areas of training are the most popular among the winners and prize winners of the technology Olympiads and competitions when

they leave school. The teachers notice that around 80% of such school students choose technical professions and areas of education. This fact proves that involvement of the pupils in the competitions and Olympiads and promotes the formation of interest in machines and equipment, different technologies, constructive work and designing activity. Moscow State Aviation Technological University, St. Petersburg University of Technology and Design and Kazan Federal University are those, among others, prestigious universities which encompass the former participants of the supra-regional competition "Constructive labor of school students".

The successful cooperation of the faculty staff and the teachers who develop the endowments of the pupils is proved by the number of the prizes at the regional round of the All-Russian Technology Olympiad. 56% teachers of the number of teachers who trained the winners and prize-winners of the regional technology Olympiad in 2013 participated along with their pupils in competition "Constructive labor of school students". In 2014 their number increased to 40%. In addition to this, 3 years in a row pupils from the Republic of Tatarstan are among the winners at the final round of the All-Russian Technology Olympiad who participated in the competition.

Conclusions

Our investigation into the problem of identification and development of the gifted children and adolescents allows us to reach the following conclusions:

1. The inclination to labor is one of the crucial factors which says about the endowments. This inclination is best revealed during the technology lessons at school, when the children engaged in project work.

2. Project work, research activity and participation in technological competitions and Olympiads are the most efficient methods to develop creative aptitudes.

3. Participation in competitions and technological Olympiads promotes the development of their endowments and forms their interest in technical and engineering occupations as well as in designing. Thus that allows them to get a profession which is on demand on the modern labor market.

However, despite the great work carried out these years in Russia on the identification and development of the endowments of children and adolescents, the latter are not under the heightened attention of state authorities, councils of creative workers, universities and scientific schools. We need to create structures for the search and support of the gifted children. In particular, in Russia, comparing to the practice of the developed states, there are not enough investigations which reveal the prospects for the gifted children in a 10 – 20 years' period.

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