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**MODERN TENDENCIES OF PSYCHOLOGICAL AND  
PEDAGOGICAL SUPPORT OF GIFTED CHILDREN**

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***Abstract***

The modern life of our society specifies new approaches to teaching and educating students. In recent years in Russia there has been developed and implemented the whole number of approaches, various innovative forms of work with gifted children. Among the problems to be solved is the formation of an integral system of systematic, purposeful interaction of educational institutions of different levels, partner organizations to support gifted children in the field of scientific and research creative activity. The article is aimed at analyzing modern trends in the formation of a system of psychological and pedagogical support for gifted children engaged in research activities in the 'school - higher education institution' interaction in the region based on materials of the Chuvash State University, the Chuvash Republic. The ongoing work is aimed at developing effective methods of psychological and pedagogical support for such children, finding out and diagnosing, enhancing scientific, intellectual and creative potential of the individual, establishing a system of scientific associations for schoolchildren at a higher educational institution. The work of the university on the active involvement of schoolchildren in the scientific and educational activities conducted by the university, aimed at identifying and psychological and pedagogical support of gifted schoolchildren, is highlighted. The presented analysis of the experience of implementing the psychological and pedagogical support of research activities of gifted children in the 'school-university' interaction system in the conditions of a regional university may be of interest for the further elaboration of continuing education and support of gifted children.

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**Keywords:** Gifted children, psychological support, research activity, scientific associations.



## 1. Introduction

One of the most pressing problems of modern Russian science is the aging of scientists. According to statistical data as of 2013, the proportion of researchers under the age of 29 inclusive makes up only 20.0%, in the 30 to 39 age group of - 20.3%, in the 40 to 49 age group of - 13.6%, in the 50 to 59 age group of - 20.6%, in the 60 to 69 age group of - 16.5%, in the 70 and older age group – 9% (Statistical handbook, 2015). There is observed a quantitative and qualitative decline in the cadre of science; the reduction in the number of scientific cadres occurs on the background of their aging, the age disproportion in the cadre of science, caused by a complex demographic situation, the aging of the scientific and pedagogical staff of the higher school system, the breach of the continuity of scientific schools (Volodina, 2014; Allahverdyan, 2014).

The problems of the development of science and state support to involve young people in scientific work are being paid a great deal of attention, which determines the special social significance and relevance of scientific research in the field of psychological and pedagogical mechanisms for involving young people in the research work from an early age, from pre-university education, its promotion, the formation of a positive motivation for scientific research in the education system.

An analysis of the current state of the problem of psychological aspects of scientific research proves that this problem is relevant to foreign and domestic studies.

Studies on the psychological problems of scientific activity abroad are covered in the works on the problems of research behavior, ethics, morality and values of scientific activity, social factors of scientific career, mechanisms and phenomena of scientific thinking, organization of scientific, scientific favoritism and social structure of the scientific team.

Psychological features and motivation of scientific research are most actively studied among students. The themes of socially-psychological peculiarities of the development of gifted children (prospective scientists in the modern conditions) in the field of scientific research are much less disclosed. The motivation for scientific activity is formed during the game at the junior and middle school age, and in the upper grades it is formed in the process of learning (Razina, 2016). Motivation for scientific activity at school age is formed extremely poorly spontaneously and requires some help from mentors, teachers, parents (Mikhailova & Razina, 2016). Since the motivation of scientific activity and the desire to do it depends on what image science has in society in general and in the representation of young people in particular, film production can be an important information channel, for example, through watching popular science films and programs or watching films about scientists with subsequent discussion (Razina & Volodarskaya, 2017).

Among the problems to be solved is the formation of an integral system of systematic, purposeful interaction of educational institutions of different levels (from school to university), partner organizations to support gifted children in the field of scientific and research creative activity.

Currently, an active process of modernizing the system of Russian education is observed. This process should be accompanied by significant changes in the psychological and pedagogical theory and practice of the educational process. New approaches require new forms, methods, models for implementing an innovative educational program. The goal of modern education is the formation of a versatile personality capable of realizing his intellectual and creative potential in changing social and economic conditions, both

pursuing his own interests and interests of the society taking independent decisions and initiative. Pursuing this goal in all parts of the education system can be carried out through the research activities of the students. There are many ways of developing intellectual and creative potential of students, but the most effective one is his own research practice.

## **2. Problem Statement**

The modern, rapidly changing life of our society specifies new approaches in teaching and educating learners. Today, education is the main social institution through which the basic values and goals of the development of Russian society can be implemented. The main purpose of education is the combination of the development of human potential enriched with moral content, with the formation of professional and general cultural competences. Today for our country the development of human potential is a matter of forming both professional and moral content of training, safety and viability of learners. In recent years in Russia there has been implemented the whole range of trends, various innovative forms of work with gifted children. Among the problems to be solved is the formation of an integral system of systematic, purposeful interaction of educational institutions of different levels (from school to university), partner organizations to support gifted children in the field of scientific and research creative activity.

## **3. Research Questions**

Today, experts capable of conducting fundamental research related to the creation of new technologies, including social ones, the implementation of projects in the field of electrical engineering and power, nanotechnology, new materials, engineering, robotics, IT industry are in great demand in the society.

In such a situation in the education system, it is necessary to overcome the lagging behind of education from science, creating an innovative educational environment focusing on demanded professions in the future, establishing profile scientific associations for schoolchildren (psychological, medical, engineering and technical, etc.), that differ from the usual ones due to in-depth studying material, teaching at the meta-subject level.

## **4. Purpose of the Study**

The research aim is to analyze modern tendencies in the formation of a system of psychological and pedagogical support to gifted children engaged in research activities in the "school - higher education institution" interaction based on materials of the Chuvash State University, the Chuvash Republic.

## **5. Research Methods**

Methods of the research imply the analysis of the work conducted on the psychological and pedagogical support of the gifted children in the field of scientific and research activity to form effective "school - higher education institution" interaction system in the condition of the Chuvash Republic in Chuvash State University.

## 6. Findings

Scientists give ground to the fact that research activity of students in itself is a powerful development tool (Semikin, Ignatenko, & Flenina, 2016; Aleksandrov, Zakharova, & Nikolaev, 2015, 2016). The analysis of psychological and pedagogical sources shows that the problems of ‘project activities’, ‘research activities’ of students, including the correlation of concepts, have been widely discussed over the past few years.

The identity of these concepts is a disputable point for many authors. Thus, finding a similarity, Ilyina (2011) sees the specifics of these types of activities in that the project, as a result of the student's project activity, is aimed at obtaining a specific planned result that has certain properties and is necessary for a particular use. While in the course of the research activity of the student, a search is organized in some area, individual characteristics of the results of the work are formulated. The negative result is also the result of such activity.

At the same time, some authors do not distinguish between research and project activities as separate ones, relatively independent ways of organizing educational activities and introduce the notion of ‘design and research activities’.

Most often, design and research activity is understood as ‘a kind of educational and cognitive activity that integrates the components of design and research activities, while the leading activity is the design of educational, quasi-professional and professional objects, each stage of which is accompanied by research, an independent search for subjectively and objectively new knowledge both on the design object and on the ways of solving project problems’ (Novoselov & Zvereva, 2009).

The research approach in the organization of this activity is becomes the leading one, aimed at developing the readiness and ability of the learner, to independently and creatively master new ways of activity in any sphere of human culture (Savenkov, 2006).

Some scholars consider the organization of research activities as a powerful innovative educational technology, which serves as a means for the comprehensive solution of the tasks of education, education and development in the society, the formation of research skills (Koyanbaeva & Zaurbekova, 2012; Kryukova et al., 2017). In the opinion of the authors, the advantage of carrying out project research work, in comparison with other forms of educational activity, lies in more effective and consistent switch from the traditional approach in teaching to productive education, aimed at developing such universal abilities and competences of learners, like ability to self-education, apart from learning skills, development of skills to navigate in information flows, the development of the ability to set and solve problems.

At present, the scientific community of Russia and the subjects of the Russian Federation are actively discussing the developed Concepts and models of specialized educational establishments for gifted children and draft normative legal acts to support their activities.

The work carried out in this direction in the Chuvash Republic within Chuvash State University is of interest.

In the conditions of the educational environment of the university, there are several main areas to support research activities of students. Among the major areas are: organizational, educational, methodological, psychological and pedagogical.

Organizational direction implies the improvement of existing forms and search for new ones to hold scientific events, forms of incentives for the quality of scientific activity of both the university staff (scientific supervision) and students; the formation of a quality management system for the R & D subsystem in an educational institution as a whole, etc.

The area of teaching activity presents preparation and development of teaching methods by the faculty staff to support scientific research of learners as well as the events Regulations, the methodical depiction of the innovative educational technologies introduction in the management of research activities.

Psychological and pedagogical direction is engaged in the search for the most effective, scientifically grounded psychological methods of activating the scientific, intellectual, creative potential, the system of motivating research activities, the systematic use of such methods and technologies in the educational process.

The analysis of existing approaches applied to work with gifted learners in the field of scientific research proves that the current work is aimed at finding effective methods for specifying and arranging events for psychological and pedagogical support of such learners, enhancing the scientific, intellectual and creative potential of the individual, forming a system of scientific associations for schoolchildren with a higher educational institution.

Over the past few years in State University (the Chuvash Republic), a lot of new projects have been implemented in this area: research competitions, Olympics for schoolchildren, the project 'University to Children', the creation of academic sections for schoolchildren at the university, thematic schools during the school holidays, contests, delivering lectures by scientists of the University on modern science trends for children, events like 'University Saturdays', 'University for children', 'Breakfast with Rector' being among them.

The objectives set by the university to be implemented in this direction include:

- creation of conditions to reveal personal creative abilities and research potential of learners to make them work, to support scientific and technical creativity of schoolchildren;
- creation of conditions for the development of mass creativity of the scientific research initiative in order to instill in them the skills of independent scientific work;
- bringing up the most gifted learners eager to be involved in the scientific work to ensure the reserve of future scientists and researchers;
- creation of conditions for the rational use by learners of their free time, their diversion from the acquisition of bad habits and antisocial aspirations.

To identify and ensure psychological and pedagogical support to gifted students, events are being held to actively involve schoolchildren in the scientific and educational activities conducted by the university. Among the objectives of these events is the popularization of scientific knowledge and the achievements of science and technology among schoolchildren; creation of conditions for the revelation and application of intellectual and creative abilities, the research potential of learners.

Thus, within the framework of the All-Russian 51-st scientific students conference on sciences and humanities dedicated to the Year of Mother and Father in Chuvashia and the 50-th anniversary of Chuvash State University and the Regional festival of students and youth 'Man. Citizen. Scientist' (Chuvash State University 2017) held in 2017 in Chuvash State University, each department arranged scientific events for schoolchildren.

At the opening of the Regional festival of students and youth 'Man. Citizen. Scientist' it has become a tradition to hold exhibitions of creative and scientific achievements of the departments, departments events presentations conducted within the Festival intended for schoolchildren, to provide information on scientific sections for children in Chuvash State University. At the opening of the Festival, a Science Quest for schoolchildren was held, when teams of schools, gymnasiums, lyceums carried out tasks aimed at revealing scientific knowledge, quick thinking and creativity.

These events, apart from traditional speeches at scientific sessions, included presentation competitions, intellectual games, debates, master classes, the use of interactive events, intellectual and business games, and elements of training forms. Such an increase in the diversity of forms provides an opportunity to resort to wider use of active teaching methods promotes students' interest in science, popularizes scientific activity.

789 schools, gymnasiums, lyceums of Cheboksary, Novocheboksarsk, districts of Chuvashia took part in speeches in sections for schoolchildren, scientific competitions, scientific quests, etc. According to members of the jury of sections and competitions, the level of work of schoolchildren from year to year is increasing, scientific conclusions and recommendations are more reasonable and realistic. This is a solemn indicator of fruitful cooperation between the university and the educational institutions of the city and the republic.

The motivation for scientific activity is formed during the game at the junior and middle school age, and in the upper grades it is formed in the process of learning (Razina, 2016; Kutuev et al., 2017). Motivation for scientific activity at school age is formed extremely poorly spontaneously and requires some help from mentors, teachers, parents (Mikhailova & Razina, 2016; Morova & Talanova, 2015). Since the motivation of scientific activity and the desire to do it depends on what image science has in society in general and in the representation of young people in particular, film production can be an important information channel, for example, through watching popular science films and programs or watching films about scientists with subsequent discussion (Razina & Volodarskaya, 2017, Sorokina & Talanova, 2015).

The Student Scientific Society, Center for work with gifted youth, the Center for Professional Orientation provide psychological and pedagogical support of scientific creativity of gifted students in Chuvash State University.

Conferences are held every year for schoolchildren in the scientific and educational sphere of the Chuvash Republic. Teachers of the Chuvash State University are the jury of the conferences: Republican conference - Festival of creativity of students 'Excelsior-2017', republican competition of research works and creative projects of junior schoolchildren "I am a researcher", scientific-practical conference of students 'Discoveries of young – 2017'. Teachers of the university become mentors and scientific supervisors of the project activity of schoolchildren.

Chuvash State University takes part in the framework of the network cooperation in the development of engineering education in the region. Teachers of the University work 5 schools. The program of work of development consists of:

- weekly conducting of laboratory and practical classes by teachers of technical faculties of the university, both in the laboratories of the university and in schools: drafting, engineering graphics, robotics, programming, 3D modeling, physics (sections 'mechanics', 'electricity', 'molecular physics'), power engineering, electronics.

- acquaintance with the organization of modern industrial production by excursions to the leading enterprises of Chuvashia - the partners of the university.

- the development of students' creative abilities and interest in research and project activities through participation in creative and intellectual competitions of the university, work in student design bureaus.

Chuvash State University hosts the Olympiad in Mathematics, Physics, Chemistry, Russian Language (for schoolchildren of the 10th and 11th grades), Olympiad in Mathematics and Physics 'Nadezhda Elektrotekhnik Chuvashii' (grades 9-11, graduate courses of professional schools).

Specific work with gifted schoolchildren in the system "school-university" lies in the continuity of the workings of the previous years with the achievements of modern pedagogy and psychology, which should be manifested in the wide introduction of various active teaching methods into the practice of psychological and pedagogical support for the research activities of learners. This task implies the promotion of activities, which are understood as the purposeful activity of the teacher, aimed at developing and using such forms, content, methods and means of teaching that contribute to increasing the interest, independence, creative activity of learners in mastering knowledge, forming abilities and skills in their practical application. Active methods of teaching are a combination of ways to organize and manage educational and cognitive activities, focused on the simulation of problem conditions, characterized by the activation of thinking and behavior of learners. Active methods of teaching contribute to the development of innovative, creative thinking, develop the ability to raise problems and arrange individual and group work on their successful solution; learn to make decisions in conditions of uncertainty or on the basis of incomplete information; create conditions to promote the learner's self-development, provide the reciprocal interaction of the learner with the teacher.

Over the past years, the Chuvash State University together with the Directorate of the All-Russian Science Festival 'NAUKA 0+', conducts activities aimed at popularizing science among schoolchildren. These events are held in a special format of the Science Festival, which has long and successfully been developed in many countries of the world under the motto of the Festival – 'touch science'. Festivals of science are designed for the widest audience aiming at explaining to the public in an understandable and accessible language what scientists do, how scientific research improves the quality of life, what prospects it opens to a modern person.

According to a joint initiative of the Ministry of Education of Chuvashia and the Chuvash State University, the project "Science to School" has been launched.

While developing educational programs, training projects, activities to form the scientific potential of learners, priority areas for the development of science and industry, staff demands of the region are taken into account.

Learners are actively involved into the work of children's scientific associations at the university. The children get acquainted with the laboratories of solar energy and high technologies, radio transmitting and radio receivers, television, circuit technology, criminal laboratory, etc. Leading professors of the university conduct classes in scientific sections for schoolchildren: 'Computer Graphics and Animation Studio', 'Young Psychologist', 'Entertaining Anatomy', 'Fundamentals of Human Health', 'Young Physicist', 'Robotics', Small Historical Academy 'Olympus' and many others.

Psychological and pedagogical support to gifted children in scientific associations for schoolchildren at the university is aimed at overcoming a number of disadvantages inherent in the training of senior

schoolchildren in a traditional educational institution: the formation of convergent thinking, the application of reproductive methods of training, insufficient skills of independent learning, and inappropriate information overload of pupils.

The emerging follow-up system is aimed at providing a transition to independent, responsible learning, using the capabilities of schools, universities, enterprises and partner organizations. Classes for gifted schoolchildren are held at the university facilities and on the production sites of the leading enterprises and organizations of the Chuvash Republic.

An innovative feature of the modern educational environment in the education system for the development of the scientific potential of gifted schoolchildren should be the educational system, the main feature of which is the connection of education, science and production by means of the creation of innovative educational clusters.

In such a complex educational environment it is possible to offer a set of educational programs, each of which is implemented in the form of a route through a system of sites, consistently getting to which the learner acquires the experience of independent responsible work forming a personal educational record.

Within the framework of scientific associations for schoolchildren, the institution provides training in devising research of the learners, which involves: identifying and setting goals and objectives of the prospective project, the ability to work with various information resources, the ability to put forward hypotheses, the selection of methods and techniques adequate to the goals and objectives of the project, planning stages of research, the ability to achieve the results, to draw conclusions and give reasoning.

Since the significant part of research, design, development and engineering activities is the defense of the results of a scientific project, classes are held aimed at developing a culture of making a scientific speech, the ability to convince listeners, communicative competences, presentation skills and self-presentation.

In this concern an important factor in this activity of scientific associations for schoolchildren is that in the educational environment of the university, along with future professional competencies, it is necessary to develop among the students morality, patriotism, civic activity, the ability to constructive social actions, creative behavior.

The implementation of this area is carried out through the research activities of students, through the enforcement of socially significant and creative projects, projects that can be used in the framework of volunteer movements, volunteer communities.

An important area of work with gifted children is holding seminars, round tables, master classes on the interaction of educational establishments to enhance the scientific, intellectual and creative potential of students. University professors, teachers of secondary educational institutions, additional education, employees of organizations connected with the organization of scientific research work of schoolchildren take part in their work.

The questionnaires of teachers and psychologists summarizing the results these seminars show the necessity for training of pedagogical staff aimed at improving competences in the field of modern methods of diagnosing and developing the giftedness of schoolchildren, their research potential, and the severe shortage of methodological tools to carry out this type of activity.

Educators believe that for the advanced development of the education system, it is necessary to personify the education and maturation of gifted children, creating individual educational charts of students.



Without individualization, it is impossible to create an educational environment motivating the formation of students' professional and moral self-determination, scientific potential, and creativity.

Being unanimous in the opinion of importance and necessity of psychological and pedagogical support of gifted schoolchildren in the conditions of the school, the teachers disagree about who and within what curriculum it is possible to do this in the existing conditions of the school. Most of them believe that the educational chart for a gifted learner should be developed by a psychologist at a secondary school in cooperation with teachers based on the analysis of both psychodiagnostic data (characteristics of interests, intellect and creativity) and scientific and educational records.

Educators note that the demand for skills in the design and research activities of students is stipulated by the interest revitalizing of schoolchildren to the participation in scientific and practical conferences of various levels (from school to All-Russian and International), the development of the Olympiad movement.

Several of the interviewed psychology educators emphasized that the development of research activities of students in the conditions of an educational organization presupposes the application of modern psychological and pedagogical techniques in the individual pedagogical system of the teacher, which often requires changing the existing individual pedagogical style and qualitative alterations in the activity of the teacher.

The backing of schoolchildren by parents, their understanding of the role and its necessity in the educational process is of utmost importance in the promotion of research and design and research activities.

One of the expected effects of this work in the regional educational area is the promotion of occupational guidance for gifted schoolchildren as prospective students of the university.

## 7. Conclusion

The elaboration of psychological and pedagogical support for the research activity in gifted children in the system of 'school-university' interaction requires further study at the theoretical and methodological, substantive and organizational level.

The results of the teachers polls show the demand for training of pedagogical staff aimed at improving competences in the field of modern methods of diagnosing and developing the research potential and giftedness in schoolchildren, the acute shortage of methodological tools offered by science at present.

The presented analysis of the experience of implementing the psychological and pedagogical support of research activities in gifted children within the system of "school - university" interaction in the conditions of a regional university may be of interest for the further development of continuing education and support to gifted children.

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