

## Distance learning for gifted schoolchildren: problems and prospects

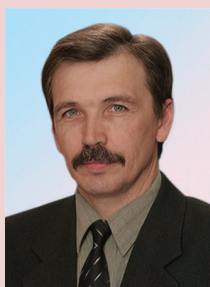
*The article dwells on the problems concerning the formation of a regional system of distance education for gifted schoolchildren. It presents the experience in distance learning of the gifted schoolchildren of the Vologda Oblast at the Centre for distance education of the Vologda Multi-Discipline Lyceum. The most promising directions of the e-learning development are considered.*

*Distance education, e-learning, gifted schoolchildren.*



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At present, the issue concerning the system work with gifted children is addressed at the state level due to the changes in the country's socio-economic development. Economic modernization considerably increases the significance of intellectual and creative potential, hence, the problem of selecting and supporting talented youth becomes a priority in modern education [9].

In this regard, the organization of a system for searching, supporting and guiding talented children is necessary. Schools of advanced educational level with developed system of competitions and Olympiads, scientific

conferences, supplementary and distance education, are established. The creation of such specialized schools for gifted children in regions requires tangible financial costs due to the relatively small number of students, as well as logistical and staffing difficulties.

Thus, only a few number of schoolchildren is involved in the learning process, whereas the need to acquire new knowledge is very important for a wide group of students. The creation and development of the regional system of distance education (DE) for schoolchildren is one of the solutions to this problem. Providing schoolchildren with equal opportunities

for in-depth education regardless of social conditions, may become a critical component of both the activities of educational institutions and the development of Russian education system in general.

Various definitions of “distance education” and “distance learning” are given in [2, 8], technologies and model of distance education are considered in [3, 5]. In this paper distance education (e-learning) is understood as the system, in which educational forms are implemented on the basis of traditional, new information and telecommunication technologies, creating the conditions for students’ free choice of academic disciplines, and the learning process does not depend on the student’s location in time and space [1, p. 6].

Distance model is especially effective for training and developing gifted schoolchildren with high level of motivation to learn, cognitive activities and intellectual abilities. More than forty years of experience of distance physical and mathematical schools indicate their significant influence on the training of future scientific personnel and form a research style of thinking. The use of distance learning system, when working with gifted children in the context of the region allows providing a brand new level of learning and development that is achieved through forming an appropriate information and education environment, the characteristic features of which are: the possibility of target audience accumulation, the realisation of personality-centered education principle, the consideration of schoolchildren’s needs and interests, the development of creative activities in schoolchildren; learner-centered character of education combined with cognitive independence of schoolchildren [4].

According to the authors, the most efficient component of working with gifted children is the establishment of a regional Centre for training gifted children with the purpose of

integrating full-time, supplementary and distance education. The Centre can be assigned the following functions: interaction with the structures, involved in the organization of gifted children’s training at the local level (in the Vologda Oblast districts); development of educational programmes for gifted schoolchildren; coordination of the Olympiad movement and research activities; distance assistance in the process of training gifted children; training workshops for teachers and management education specialists; the development of distance educational resources, etc.

At present, distance learning programmes for gifted schoolchildren are quite obscure in Russia and are implemented at the regional level, primarily on the basis of experimental platforms at universities or centres for gifted children’s training.

The authors assume that the experience of foreign countries, particularly the USA with its system of distance education being one of the most developed in the world, can be used in such situation. The centres for talent development, implementing distance learning programmes as well, have been established in many universities of the country. For example, the education programme for gifted youth (EPGY) has been operating at Stanford University since 1992, comprising multimedia courses in Mathematics, Physics, Computer Science. The distance programme LearningLinks has been operating at the Centre for Talent Development at the Northwestern University, USA for over 20 years. Several thousands of gifted students of 6th–12th grades took part in the Programme that comprises many e-learning courses, including a course for excellent students (Honours level), and advanced programmes (Advanced Placement) [6].

Let us consider the experience of distance learning in the Vologda Oblast. The Centre for distance education (CDE) at the Vologda Multi-

Discipline Lyceum (VML) carries out training in the majority of subjects since 1994 [7].

The main CDE objectives are the following:

- to detect gifted schoolchildren in Mathematical and Natural Sciences, Humanities and to create conditions for improving their intellectual abilities;
- to assist schoolchildren in deeper and more advanced study of various academic disciplines and in the preparation for the Unified state examination;
- to use modern information technologies for providing students with opportunities for further education.

The VML CDE activities are developed in the following directions: implementation of distance education (forms 5-11 of the Vologda Oblast schools), organization of e-Olympiads, open Olympiads for students of 4th-8th forms of the Vologda Oblast schools).

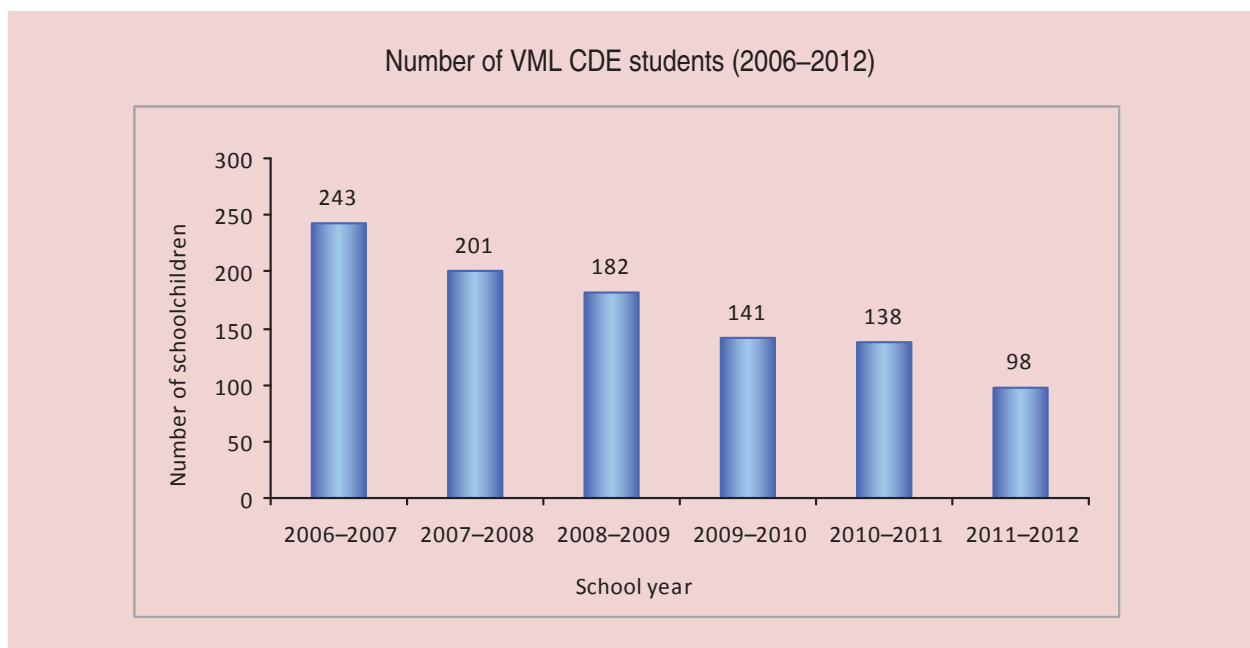
**Distance learning.** At present, network and case-technologies of distance learning are used in the Lyceum, with a gradual transition from the case-technologies to networking technology by “Student-Internet-Teacher” model. For this purpose the freely distributed system of distance education “Moodle” was put on the Lyceum’s

web-site. This software product is constructed in compliance with the standards of information education systems. Due to the wide range of resources and interactive elements, the system allows creating wide variety of courses and implementing an interactive communication mechanism.

This model is especially effective for supplementary schoolchildren education, as it is aimed at the in-depth study of any subject or topic, pre-entry training, participation in competitions of different levels, etc.

CDE teachers have created methodological manuals, not duplicating the school curriculum and designed for advanced and in-depth study of subjects: for example, Dirichlet principle (Mathematics, 5th form); discrete continuity (Mathematics, 7th form); the application of the mass center and inertia moment concept to the solution of geometrical problems (Mathematics, 5th form); problem-solving on kinematic relations (Physics, 9th form), etc.

About 1000 students from almost all districts of the oblast have been trained in VML CDE for the past six years, 14 of the students were admitted to the Lyceum for full-time studies (*figure*).



Overall decrease in the number of students was caused by the decline in the number of high school students (9th, 10th, 11th forms) mainly because of the fact that the methodological developments for senior forms, compiled on the basis of programmes for in-depth study of Mathematics, Physics and Chemistry, contain a large number of materials and activities of Olympiad level that are very difficult for students. Moreover, as a result of greater Internet access, schoolchildren of the oblast districts are now able to find educational materials independently. In order to increase the number of CDE, it is necessary to review the level of control tasks in methodological developments on the subjects and to simplify them, to elaborate methodological manuals, covering more thoroughly the tasks of the Unified state examination and of the State final attestation levels. More attention should be paid to e-courses with the use of web technologies.

**E-Olympiads.** The Centre for distance education annually conducts distance Olym-

piads that are aimed at finding students interested in studying particular disciplines, and preparing students to city and district Olympiads. The texts of Olympiads are placed every September on the Lyceum's web-site (<http://www.vml-vologda.ru/>).

It should be noted that the interest of the Vologda Oblast high school students in participating in the Olympiad has somewhat decreased, while the number of works from other Russian regions (*tab. 1*) has increased. 1151 schoolchildren from 26 Russian regions and the Republic of Belarus took part in the XI e-Olympiad. The largest number works was submitted by schoolchildren of the Vologda Oblast, the Republic of Belarus, the Chuvash Republic, and the Samara Oblast (*tab. 2*).

Schoolchildren from 19 districts of the oblast took part in VML e-Olympiad; the best performance results is observed in Totemsky, Gryazovetsky, Sokolsky districts and in Cherepovets (*tab. 3*).

Table 1. Main indicators of VML distance Olympiad (2007–2012)

Indicator	2008/09 school year	2009/10 school year	2010/11 school year	2011/12 school year	2012/13 school year
Number of subjects	9	11	12	10	10
Number of participants, people	590	923	1170	1232	1151
Number of RF regions, represented by participants	16	20	45	20	26
Number of participants from RF regions, people	160	196	571	501	534
Number of participants from Russian regions, % from total number	27	21	48	40	46

Table 2. Regions of the Russian Federation and CIS countries with the largest number of VML e-Olympiad participants in 2012/2013 school year

Region	Number of participants	% from total number of participants
Vologda Oblast	617	53.6
Republic of Belarus	70	6.1
Chuvash Republic	67	5.8
Samara Oblast	56	4.9
Moscow Oblast	40	3.5
Irkutsk Oblast	37	3.2
Republic of Tatarstan	37	3.2
Saint Petersburg	35	3.0
Rostov Oblast	32	2.8

Table 3. Vologda Oblast municipal districts with the largest number of VML e-Olympiad participants in 2012/2013 school year

Municipal districts and cities of oblast subordination	Number of participants	% from total number of participants
Totemsky District	118	19.1
Gryazovetsky District	103	16.7
Cherepovets	87	14.1
Sokolsky District	74	11.8
Vologda	49	7.9
Sheksninsky District	40	6.5
Chagodoshchensky District	27	4.4
Vologodsky District	20	3.2
Nyuksensky District	18	2.9
Kaduysky District	17	2.8
Vozhegodsky District	14	2.2
Velikoustyugsky District	14	2.2
Babushkinsky District	12	1.9

As VML e-Olympiad has become traditional, the authors consider it expedient to introduce it in the event list of the Vologda Oblast Department of Education.

The development problems of VML Centre for distance education are the following:

- material and technical: lack of resources (server, computers for teachers, web-cameras, high-speed Internet) for online classes and e-courses; low-speed Internet in some areas;
- personnel: insufficient competence of teachers in the field of information technologies and distance education;
- scientific and methodological: insufficient development of approaches to the formation of education resources for distance education for the gifted schoolchildren based on personality-oriented approach, depending on the individual educational needs of a schoolchild;
- economic: lack of funds to pay teachers for the course development on the basis of distance education programmes.

The analysis of foreign and national experience reveals common problems in implementing distance education of gifted schoolchildren in school practice [5, 6, 11, 12]:

- lack of fundamental and large-scale practical research in distance education theory and practice in the system of general education;

- lack of efficient methods of distance education of gifted schoolchildren;

- low level of teachers' commitment to realise the process of distance education or to use information technologies;

- poorly developed quality control facilities and systems of distance education;

- insufficient financial support to the development of the given direction.

According to the authors, the most promising and rapidly developing online learning technologies are crowdsourcing, video lectures and webinars.

Crowdsourcing, which is a popular socially oriented technologies development trend at present, implies the involvement in problem-solving of many people on the basis of their voluntary and frequently gratuitous participation [10, P. 158]. Internet forums and communities in social networks are the most popular for training to the USE and Olympiads.

For example, more than 40 thousands of various training modules from lesson plans to interactive tests are collected on the website *Curriki.org*, and some *vkontakte* social network groups comprise hundreds of thousands of participants. All materials are freely distributed and are available to anyone.



Growing popularity of online education is another significant factor of virtual learning. High-speed Internet has become really widespread over the last decade, information development and transfer have sharply fallen in price, the number of mobile devices has rapidly increased, making the widespread use of web-technologies possible.

The Khan Academy is one of the most famous innovation projects in online education. More than three thousand lessons in various subjects (hosted via YouTube) are available through Khan Academy and have been viewed over 200 million times. Interaction tests, statistical instruments and instruments for observing schoolchildren performance, including teachers' extended functionality, have been actively developing. Note, that the project is non-commercial and has been operating under the crowdfunding scheme, sponsored among others by Bill Gates, Netflix CEO Reed Hastings, Google, etc.

Considering modern trends of distance education in Russia and abroad, the authors suggest basic directions of the process implementation for VML CDE as a regional center for distance education of gifted students:

- to develop courses for students of 5th–8th forms based on the existing methodological manuals on the ground of distance learning Moodle shell;
- to organise and to hold real-time online Olympiad;
- to establish forum on the CDE website for discussing issues, related to organising and conducting various Olympiads;
- to organise work with schoolchildren, who are participants of the oblast Olympiads or winners of district and city Olympiads in terms of training to the next Olympiad stages (including webinars, online consultations);
- to initiate the development and the implementation of elective courses (including the use of video lessons) for schoolchildren of 9th–11th forms in the profile distance learning programme.

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