

SCTMG 2020**International Scientific Conference «Social and Cultural Transformations in the
Context of Modern Globalism»****ORGANIZATION OF DISTANCE LEARNING (FOR EXAMPLE,
LESSONS IN MATHEMATICS AND PHYSICS)**

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Abstract

The advantages of distance education are primarily determined by the equal opportunities for education by all people, regardless of their material condition, social status, age, place of residence and even people in places of deprivation of liberty, as well as the opportunity to receive information at any convenient time. The distance education system most flexibly responds to customer needs and ensures the constitutional rights of citizens to education. Distance education has established itself as the most effective system of training people of all ages, self-education and the continuous maintenance of a high qualification level of specialists. The problem of the development of pedagogical technologies, methodological recommendations and the presentation of educational content in electronic form, the development of digital educational resources, and, of course, the issue of training teachers who are able and willing to use distance learning, the possibility of IT in the educational process, remains relevant. The iSpring distance learning system is one of the promising environments. This training portal has the ability to work on almost any computer that has a browser and is connected to an Internet connection. The iSpring distance education system is a single center for distance learning management, which operates in the 24/7 mode. That is, students have the opportunity to receive or acquire knowledge, study the laid-out courses, take tests 24 hours a day and every day without days off. Education is not limited by space (training class. Not by time). Learning outcomes remain under control.

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Keywords: iSpring, interactive training, virtual laboratory, 1C: Mathematical constructor, distance learning.



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1. Introduction

An analysis of studies on the organization of distance learning shows that, despite the fact that distance learning has firmly entered our lives, most of the practical application has been found in higher education. But there is a category of schoolchildren who need education in a remote way. This fact of the introduction of distance education in the educational process of high school cannot be called unique. Distance learning tools can be used in full-time educational process. Table 1 below presents some of the reasons why there is a need for the use of distance technologies in the general educational process in conjunction with traditional training.

Table 01. Reasons for the need for remote technology

Cause	Justification for the use of distance education
Lesson Skips	Timely passage of material
Unapproved topics	Addressing gaps, conducting consultations
Grade Correction	Knowledge control
Increased interest in the subject	Holding conferences, olympiads, electives
Need to play the lesson again	The presence of a visual aid with a detailed explanation of the topic of the lesson with the possibility of self-test
Material development	Self-control

The above reasons outline the need for an individual learning path, which in this case will be understood as a personally significant way of mastering the educational program, where the content and structure of the path is determined considering the educational needs and cognitive independence of the student.

The teacher plans a program of educational activities; determines the procedure for searching the information necessary for him to carry out this activity; distributes rights, duties and powers between participants in the educational process; seeks resources for the implementation of the learning process, evaluates the achieved result, analyzes and eliminates negative deviations (Yusupova, Sadulaeva, Khataeva, Abdullaev, & Muradova, 2019).

This statement necessitates the introduction and active use of software that allows for the integrated use of distance technologies in the general educational process with the aim of improving the quality of knowledge and motivation of lagging students.

Thus, we are faced with the task: to identify the most optimal shell of distance learning, which includes a set of distance technologies used both in full-time education as an auxiliary tool and in distance learning with the aim of the main way of obtaining knowledge.

2. Problem Statement

The demand for distance learning shell is determined by the following criteria:

1. accessibility (commercial or distributed freely);
2. minimum shell education tool kit distance education:
3. functionality (the presence in the system of a set of functions of various levels, such as forums, chats, analysis of the activity of students, management of courses and students, as well as others);

4. preservation of traditional forms of education;
5. control of results;
6. joint work of students;
7. creating questions and managing tests;
8. content creation.

Before talking about the most optimal means, it is necessary to select an audience for distance education: these may be groups of completely different “gradations”. We are talking about groups from secondary schools. Therefore, the scope of shells distance education can be significantly narrowed. Below are some of the shells that can be used in school courses:

1. free Moodle shell
2. distance learning and testing system SDOT "Karat"
3. 1C: Education 5. School
4. Ispring
5. JoomlaLms™
6. Wiki
7. Net school.

The entire list of distance learning shells cannot be called complete. But given that educational institutions need a universal resource that allows them to improve training, both basic and at a distance, a list of criteria is needed that determine the most optimal virtual environment, the tools of which enable the teacher to carry out the following tasks:

1. Education for students in home schooling;
2. implementation of an individual approach;
3. monitoring students' knowledge at a distance;
4. the development of cognitive interest of students;
5. development of research abilities of students;
6. development of the creative approach of schoolchildren;
7. the development of logical thinking;
8. the ability to work in groups;
9. the development of perseverance.

Table 2 below presents an analysis of some shells of distance education, revealing the most optimal environment that meets the above objectives.

The results of the study show that JoomlaLms is the most optimal virtual learning environment. But I would like to dwell on the iSpring shell, the tools of which enable the teacher to prepare materials for the lesson, not only remote, but also full-time.

iSpring works as an add-on to PowerPoint. It turns PowerPoint into a powerful tool for creating interactive Flash online courses that can be viewed on any computer, regardless of platform (Yurchenko, 2011).

Table 02. Analysis of some distance learning shells

The product's name	Storage of personal information	Student Performance Monitoring	Self-control	Forums, chats, private messages	Author training courses	Webinars
1C: Education 5. School	+	+	+	+	+	-
Ispring	+	+	+	-	+	+
Moodle	+	+	-	+	+	-
JoomlLms ^{ru}	+	+	+	+	+	+
Wiki – среда	+	-	-	+	+	-
Net school	+	+	+	+	+	-

Pros of iSpring Suite:

1. publication in any system of distance education;
2. the use of tests and surveys;
3. adding sound;
4. creation of video lectures;
5. adding interactivity;
6. customization of design and navigation.

When developing didactic electronic materials for distance education, it is necessary to be guided by certain principles that can be fully implemented in this shell, presented in table 3.

Table 03. Principles for developing distance learning courses

Principles of developing distance education courses	Implementing Principles in iSpring
Minimize access to additional literature	The teacher has the opportunity to develop a whole topic with a detailed explanation, to provide the student with full lessons on each paragraph, thereby reducing the need for the student to turn to additional sources for help.
Modular principle	The teacher develops entire blocks of lessons on each topic, where one lesson smoothly passes into another, while maintaining the semantic chain of the structure of the topic
Instructions for studying the material and organizing independent work	The student can receive instructions on-line by directly communicating with the teacher himself; also, when developing each lesson, the teacher prescribes instruction for the student's actions on each slide, thereby organizing all the student's activities
Control tasks, questions for self-testing with answers.	Development of tests, independent work, tests, tests

The use of distance technologies in the general educational process provides not only supporting material for training, not only the opportunity to practice missed lessons or a way to increase motivation for learning activities. Distance learning should include all these elements, which together gives us a universal way of teacher communication with students (Kolbin, 2007).

As a result, we get a universal apparatus for the development of children, allowing us to communicate not only with a certain circle of people on a specific issue, but also expanding the

possibilities for solving assigned tasks and problems. To fulfill all of the above tasks and goals, many distance education shells will do. But you need to consider the factor of visibility, accessibility to various methods of solving the problems posed, you must have instructions with the most understandable explanations. In this case, all these factors are performed by iSpring Suite (Strekalova, 2013)

3. Research Questions

Subject of study – distance learning in mathematics and physics.

4. Purpose of the Study

The purpose of the study is to study the possibilities of teaching mathematics using distance learning forms in lessons at school.

5. Research Methods

In solving certain problems, research methods were used: analysis and comparison, propaedeutic and heuristic, observation method and practice.

6. Findings

Using the virtual laboratory “1C: Mathematical Constructor 6.0” at mathematics lessons in grades 5–7 showed a noticeable improvement in the quality of training and testing students' knowledge. Designing the conditions of tasks and the possibility of interactive work with a model corresponding to the topic of the lesson increased the interest of students in these disciplines. The requirement to ensure visualization in the case of using virtual laboratories should be implemented at a fundamentally new, higher level, the first moments of “enthusiasm” from these technologies in the learning process are erased and it is necessary to constantly maintain interest and motivation of students (Haddon, 2004)

In the course of this study, an analysis was made of the possibilities of organizing distance learning in mathematics and physics at school; studied the experience and suggestions of network schools, educational portals of the country; analyzed the market of digital educational resources; the technique of using distance learning in mathematics and physics is investigated; A number of suggestions were made on the methodology for using Mathematical Designer 6.0. in mathematics and virtual physics labs for schoolchildren.

7. Conclusion

During the study, an analysis of many educational portals of the Russian Federation was carried out, which is noted in the text of the work, the products offered on these portals are considered. Particularly interesting for working in the lessons of mathematics and physics was the Mathematical Designer and the Virtual Laboratory for Physics for schoolchildren, in connection with which they were tested in the lessons of mathematics and physics at school (Yusupova & Sadulaeva, 2017).

Using the virtual laboratory “1C: Mathematical Constructor 6.0” at mathematics lessons in grades 5–7 showed a noticeable improvement in the quality of training and testing students' knowledge. Designing the conditions of tasks and the possibility of interactive work with a model corresponding to the topic of the lesson increased the interest of students in these disciplines. Similarly, the use of the Virtual Laboratory for Physics for students in the classroom significantly increased the motivation of students to learn, and also increased the overall level of academic performance in this discipline. Students took the initiative to participate in various projects in a virtual laboratory (Mnatsakanyan, 2014).

In the course of the study, the following tasks were completed: the analysis of the possibilities of organizing distance learning mathematics at school; studied the proposals of network schools, educational portals of the country; analyzed the market of digital educational resources; the technique of using the distance form of teaching mathematics is investigated; A number of suggestions were made on the methodology for using Mathematical Designer 6.0. in mathematics and virtual physics labs for schoolchildren.

An important result of the study of the organization of distance learning in mathematics and physics, the use of information technologies in the educational process is an increase in the interest and motivation of students to study physical and mathematical disciplines, the development of students' abilities through visualization of educational material, the possibility of creating an interactive model of the problem to be solved, and solving a number of similar tasks, the use of interactive hints and the ability to check the solved problem.

The advantage of organizing distance learning is to increase the motivation of students to learn in the conditions of using the Internet, PC, tablets, mobile phones, i.e. in an environment close to them, where they feel comfortable.

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