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The methodical bases on realization of online mathematics lessons in secondary schools

In article there is considered the role of information technologies, widely used in all spheres of public life, and also the network services applied in educational process. It analyses teaching mathematics at secondary schools by means of information networks, the software of bases of online lessons. Requirements for carrying out online lessons are listed, on their basis methodical recommendations about carrying out network lessons are developed. In article there is given an assessment to information technologies, to differences of online lessons from classical types, to methods of organization and carrying out online lessons.

Key words: Internet, e-mail, a teleconference, multimedia, online lesson, communication technologies, computer communications, the pedagogical experience, educational process, Integration.

Our Head N. A. Nazarbayev in the message to the people of Kazakhstan said that "National competitiveness first of all is determined by the level of its education. The unique way of sovereign independent Kazakhstan in achievement to the world civilization – is in education system" [1].

In the Law of the Republic of Kazakhstan "About education" it is specified that "A main goal of an education system – national and universal values, forming of necessary conditions for the education directed to forming of the personality and professionalism on the basis of achievements of science and practice; implementation of new technologies of training; education informatization, entry into the international global communication networks" [2].

Due to the current of time before teachers are given new requirements for increase of interest to education at pupils. For this reason new technologies of training are formed and take root. As a result of comprehensive study both quality and amount of new pedagogical technologies grows in education. The teacher has to work always creatively that will bring him closer to innovation. Usage of examples of others in his work, accession his personal qualities – his achievement in teaching and education of pupils. It is known that more than 50 modern pedagogical literatures are introduced in educational technologies.

Such opportunities of the Internet as e-mail, a teleconference, Mailing lists, electronic textbooks, electronic libraries, information search in WWW are widely used in education. Also, lessons with use of resources of network, such as animation, applets or interactive virtual laboratories in online mode are conducted when carrying out a lesson.

One of forms of modern teaching is considered an online lesson which expands and develops the horizons of traditional methods of teaching, develops informative and creative activity of pupils, gives the chance for complete development of a training material. With respect thereto, carrying out of online lessons when training mathematics is considered one of topical issues.

Online technologies in the properties are close to the usual lessons conducted in audience that provides exchange of information in the present, however, at the same time, demands equipment of educational classes with computers and Internet connection and projective devices, means for video conference communication and presence of teachers and pupils at computers.

Online lessons are conducted by the experienced teachers living in other city, in other country, and pupils can live in the most distant villages and the cities of our country and the whole world. Pupils use own computers or school computers in computer classes for participation in online lessons. Bilateral communication without an exit from the house or school gives the chance to reach directly to efficiency and quality of the lesson. There usually participate one teacher and five-six pupils from the house or a class in such lessons. The most profitable technology of online teaching is a video-conference [3].

In respect of the organization the online lesson differs with limitation of time allocated for a lesson, constancy of structure of pupils, carrying out a lesson according to the schedule, carrying out a lesson only in a virtual look.

Main types of online lessons: acceptance and development of new knowledge, formation of skills and knowledge, problem lessons, the mixed lessons.

Pedagogical features of online lessons:

– Unity of functions of teaching and education, actions of the teacher and pupils, content of teaching and methods of education;
– Activity of pupils when making written answers in the mode of "forum", "chat", "blog";
– Development of informative qualities (i.e. the aspiration to learn new in the course of creative search and execution);
– Unit of the didactic purpose and subordination of separate parts, lesson elements to this unit;
– Formation of a lesson and its parts according to the maintenance of a lesson, regularity of development of a training material, the venue of a lesson.

Feature of these properties providing efficiency of a lesson, on the one hand, is objectivity of training process, on the other hand, shows, how deeply the teacher mastered the content of a lesson, shows regularity of development, etc. (subjective aspects of training process). Besides, fulfillment of requirements, shown to a lesson, considering works of the teacher and feature of group of pupils, doesn't limit the methodical help.

The teacher of online lesson has to master work with information and communication technologies at the high level. The organization of educational process at distance education training demands from the teacher carries out educational process as in specialized information training center. The teacher can collect the class in convenient time [4].

Structure of online lessons same as well as structure of usual lessons: training updating, explanation of new material, fixing, observation. The following methods are applied: explanation, reproduction, internal search and others. However, the orientation of a lesson differs with interactivity, urgent feedback with specialists -advisers, expansion of information outlook of a lesson.

It is possible to use the next methodical ways at online lessons:

1. Use of Internet technologies by the teacher: organization of an educational conversation with leading experts of a subject;

2. Use of Internet technologies by pupils: consultation with leading experts in the video-conference mode on subject of a lesson;

3. Observation of knowledge: network project, network competitions, Olympic Games, quizzes;

4. The conversation of pupils with multimedia acquaintants develops their language, thinking, memory, and trains to allocate the main thing, to define logical communications.

5. Role-playing game – divide group of pupils into little groups and give them the following tasks:

– Analysis of a topic of the lesson. Allocation of opinion of the author of a lesson.
– Search on the Internet and placement of the reference to this resource at a forum.
– The short description of opinions of foreign and domestic scientists on this subject.
– Search on what page is information on this subject in the Internet, the indication of own opinion to a subject.
– Comparison of designations, their use in the text, an explanation of their emotional color and others, analyzing it at a forum.

The benefit of online lesson before traditional lesson is comprehensively considered: expansion of information outlook of a lesson, involvement of teachers of others educational institutions (schools, gymnasiums and lyceums) to a lesson, a victory over a geographical favor and others. This opportunity is also good for educational institutions where the limited number of teachers is observed, and for institutions which teachers can't participate in rates on increase of qualification.

The algorithm of the organization of online lessons consists of the following stages:

– The choice of a subject with participation of skilled experts;
– Justification of the choice of the teacher;
– Observation of training (granting an opportunity to the teacher to conduct a lesson at first before small audience).

On the other hand, online lessons don't differ from traditional lessons, i.e., the purpose and duties are completely executed, stages remain. The applied methods are also left without changes.

Didactic opportunities of such online lessons:

– Integration with other objects;
– Systemacity and high level of submission of information within program material;
– Maximum security with computer communications;
– Support of educational process from the methodical part [5].

Carrying out online lessons from all points of view exerts a great influence on quality. On this basis, in connection with carrying out online lessons we prepared the methodical instruction "Methodic of carrying out online lessons". In this methodical benefit are described questions of carrying out online lessons and considered types of online lessons. The educational and methodical benefit is intended for teachers of secondary schools and students of specialty "Mathematics".

In the methodical instruction the main types of online lessons, pedagogical features, a technique of carrying out are considered.

In methodical benefit there are noted methods of transfer of audio and video information by means of technology of a video-conference, usage of modern achievements in the sphere of chats and forums. On the basis of it, in the methodical instruction there is considered the method of carrying out online lesson with use of technology of a video-conference, demonstration experience, and satellite communication, with use of Internet resources on a subject.

As additional information, in the methodical instruction there are given several video of the lessons conducted by the undergraduate of the specialty "Mathematics" 6N010900 of the Karaganda state university named after Ye.A.Buketov A. Kaparova Videos lessons have been conducted in 2015-2016 academic year to pupils of the 5th class of KGU №92 gymnasium" of the city of Karaganda on the following subjects: "The image of fractions and the mixed figures in system of coordinates", "The solution of tasks of a subject of reduction of simple fractions to the common small denominator", "Comparison of simple fractions". Lessons were very interesting for pupils. After each lesson, skilled school teachers have expressed their opinions. Thus, the shortcomings and advantages noticed during a lesson were analyzed.

Nowadays, in our country many teachers exchange the pedagogical experience by means of carrying out online lessons. Thus, after a lesson, they exchange opinions and analyze mistakes and advantages of a lesson.

In this regard, it is clear that the methodical instruction on carrying out online lessons will be big help for many teachers, including, for the young teachers which only begin their work. Now, due to the lack of methodical rules based on a scientific basis on the organization of online lessons, there are problems at the solution of many questions connected with network.

In conclusion, we will note that main purposes which are set before education consist in increase of national competitiveness, in complete entry into world education, on raising of an education system on the international level, in implementation of achievements of information and communication technologies in the course of education, in effective and wide use of electronic textbooks and multimedia programs, in interaction of information infrastructure of the country with world education, in strengthening of ties between organizations of education. Objective of interaction condition in world network is wide possibility of obtaining and exchange of information in education. Use of network in online mode allows people to communicate in an information and education key, timely and reliably to transfer information.

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Жалпы білім беретін орта мектептерде математика пәнінен өткізілетін онлайн-сабақтардың әдістемелік негіздері

Мақалада бүгінгі таңда қоғамның барлық салаларында кеңінен қолданыс тапқан желі қызметтерін оқыту үрдісінде пайдалану мәселесі қарастырылды. Жалпы білім беретін орта мектептерде математика пәнін оқытуда сол ақпараттық желінің қызметіне жүгіне отыра онлайн-сабақтар өткізудің әдістемелік негіздері зерттеліп, нақты жүргізілген жұмыстарға практикалық тұрғыда талдау жасалды.

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Методические основы проведения онлайн-уроков по математике в средней школе

В статье рассмотрены роль информационных технологий, широко используемых во всех сферах общественной жизни, а также сетевые сервисы, применяемые в учебном процессе. Проведены анализ преподавания математики в средних общеобразовательных школах с помощью информационных сетей, программного обеспечения основ онлайн-уроков. Перечислены требования для проведения онлайн-уроков, на их основе разработаны методические рекомендации по проведению сетевых уроков. Дана оценка информационным технологиям, показаны отличия онлайн-уроков от классических типов, методы их организации и проведения онлайн-уроков.

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