

УДК: 53(07)

*Kuanshbek M. N., Dalelkhan A., Kaptagay G. A.
E-mail: maira.kuanshbek@mail.ru
Kazakh national teacher training university, Kazakhstan*

FEATURES OF TEACHING PHYSICS DISTANCE AND DIGITAL RESOURCES

Distance learning is complementary to traditional training with the use of IT technology. Interaction occurs not only between the teacher and the students, but also between groups or individual students. The article deals with the problems of organizing lectures, practical and laboratory classes in physics in a remote format. The Miro virtual whiteboard will help the teacher to captivate students with the lesson, motivate them to actively participate, achieve results and work collectively. The article provides specific examples of the use of distance learning methods using a virtual whiteboard when studying Physics in the 8th grade.

Key words: distance learning, virtual whiteboard, digital resources, motivation.

*Куанышбек М. Н., Далелхан А., Каптагай Г. А.
maira.kuanshbek@mail.ru
Казак улуттук кыз-келиндер
педагогикалык университети,
Казакстан*

ФИЗИКАНЫ АРАЛЫКТАН ОКУТУУНУН ӨЗГӨЧӨЛҮКТӨРҮ ЖАНА САНАРИПТИК РЕСУРСТАР

Дистанттык окутуу салттуу окутууну трен технологиясын колдонуу менен толуктайт. Өз ара аракеттешүү мугалим менен окуучулардын ортосунда гана эмес, ошондой эле топтордун же жеке окуучулардын ортосунда болот. Макалада физика боюнча лекциялык, практикалык жана лабораториялык сабактарды аралык форматта уюштуруу маселелери каралат. Муро виртуалдык тактасы мугалимге окуучуларды сабакка кызыктырууга, аларды жигердүү катышууга, натыйжаларга жетишүүгө жана жамааттык иштөөгө түрткү берет. Макалада 8-класста физиканы окуп-үйрөтүүдө виртуалдык такта менен аралыктан окутуу ыкмаларын колдонуунун конкреттүү мисалдары келтирилген.

Өзөктүү сөздөр: аралыктан окутуу, виртуалдык такта, санариптик ресурстар, мотивация.

*Куанышбек М. Н., Далелхан А., Каптагай Г. А.
maira.kuanshbek@mail.ru
Казахский национальный женский
педагогический университет,
Казахстан*

ОСОБЕННОСТИ ДИСТАНЦИОННОГО ОБУЧЕНИЯ ФИЗИКЕ И ЦИФРОВЫЕ РЕСУРСЫ

Дистанционное обучение — это дополнение традиционного обучения с применением IT технологии. Взаимодействие происходит не только между учителем и учениками, но и между группами или отдельными обучающимися. В статье рассматриваются проблемы организации лекционных, практических и лабораторных занятий по физике в дистанционном формате. Виртуальная доска Муро помогает педагогу увлечь учеников уроком, замотивировать их на активное участие, достижение результатов и коллективную работу. В статье приводятся конкретные примеры применения методов дистанционного обучения с применением

виртуальной доски при изучении физики в 8 классе.

Ключевые слова: дистанционное обучение, виртуальная доска, цифровые ресурсы, мотивация.

The development of information technologies and informatization of society leads to a change in the importance of education and its appearance. Information technologies and types are constantly changing to take into account and meet the emerging needs of society through influence. In order for educational services to be in demand, the possibility of distance learning must be very high. Initially, online learning was only for the purpose of additional education, and the current pandemic has forced distance learning in the form of regular classes. As a result of the sharp transition to the distance format and the involvement of all students in this process, the problems of this type of training were immediately reflected, which included all the problems of educational organizations: communicative, educational, organizational and technical difficulties [1].

The vast majority of teachers have not passed professional training in the methodology of distance learning. The students were also not ready to work in this format. Difficulties also arose due to their individual characteristics, educational conditions, skills in using computer technologies and Internet resources. Currently, there is no distance learning technology that takes into account certain individual characteristics of each student.

However, given all this, distance learning is not the main form of learning, it is only an additional character. Traditional daily lessons are fundamental in our lives, despite the rapid development of Information Technologies [2, 3].

At the same time, it requires a lot of motivation of students, and it is necessary to maintain the necessary pace of independent learning without assistance. Insufficient computer literacy can become a serious problem in distance learning, which is a disadvantage in this type of education. Now in the world, some people do not have enough computer literacy to work with a computer. In addition, it is not enough to have a certain basic knowledge of a personal computer, it is very important to be able to work on the internet and process the available information. Another disadvantage is the user identification problem. It is very difficult to determine how much a student has done this or that job while studying. A comprehensive approach to distance learning in physics is required, involving the solution of a number of tasks related to the development of the theory and methodology of distance learning in physics, the content and organization of the educational process in distance learning in physics, with the development of appropriate educational and methodological support. At the same time, the practical implementation of distance learning in physics is impossible without the availability of teachers trained to work with distance learning technologies, a developed telecommunications structure in the regions of our country, a regulatory framework and a number of other conditions.

At the same time, the purpose of the lesson is not fully achieved due to the fact that the board used in the classroom is not available. However, it is difficult to use it at a distance: the only way to solve it is to capture the work on camera in the classroom.

On physics we must organized lecture, practice and laboratory works.

The first task was solved most simply by using the capabilities of the Zoom platform. The format familiar to students was easily implemented using a presentation Power Point, which includes the main lecture points, demonstration videos of physical experiments and explanation of conclusions and difficult moments by writing on a sheet and demonstrating with an additional video camera. A recorded lecture session is often used by students or schoolchildren who could not attend the lecture or wish to repeat it study. It was noted that the distance format of lectures increased the activity of correspondence students who miss full-time classes due to the inability to leave work. During the lecture, there is an opportunity to

organize feedback, which is important for a high-quality lecture at a sufficiently high level. It is advisable to conduct a workshop on solving problems in the following types: in broadcast mode (using an active whiteboard, video conferencing, flash demonstrations), in consultation mode (chat, forum), in interactive mode (when working directly in the Zoom with a separate computer program for solving problems in physics).

The main problems of distance learning of physics:

- Strong motivation is required;
- Less communication;
- The problem of user identification;
- Methodical problems organization of practical and laboratory classes.

A teacher of physics should possess not only their subject area and to a certain extent related fields of knowledge, but also pedagogical, psychological knowledge, the features of the concept of distance learning in physics, as well as information and telecommunication technologies, the specifics of the organization of the educational process in a distance form. Practical exercises on solving problems are organized according to approximately the same scenario, but the importance of implementing feedback increases many times. When solving problems, it is important for the teacher not only to demonstrate his solution, but also to see the solutions of all to be able to discuss the problems that have arisen, to respond to errors in a timely manner, to be able to involve the largest number of conference participants in the discussion, to respond promptly to possible proposed solutions, to show errors and explain the possibilities of their correction. The use of virtual whiteboards in distance learning will not completely replace the traditional whiteboard, but will replace it as much as possible. One of the virtual whiteboards: using the Miro interactive whiteboard is a virtual analog of the classic whiteboard. With its help, we can not only visually present the material to students, but also organize project and team work, design a certain process, organize a brainstorming session, and thus conduct an interesting, interactive lesson.

It is advisable to study the physical experiment in distance learning in three ways: firstly, conducting video recordings of real experiments, repeatedly showing them to trainees (in the form of synchronous and asynchronous broadcasts); secondly, showing so-called virtual and model experiments (made in on-line mode or prepared in advance); thirdly, conducting a remote access physical experiment using special software and hardware complexes in physics in real time, changing parameters with subsequent discussion of the experiment results.

The forms and methods of conducting laboratory classes in distance learning in physics have the following features:

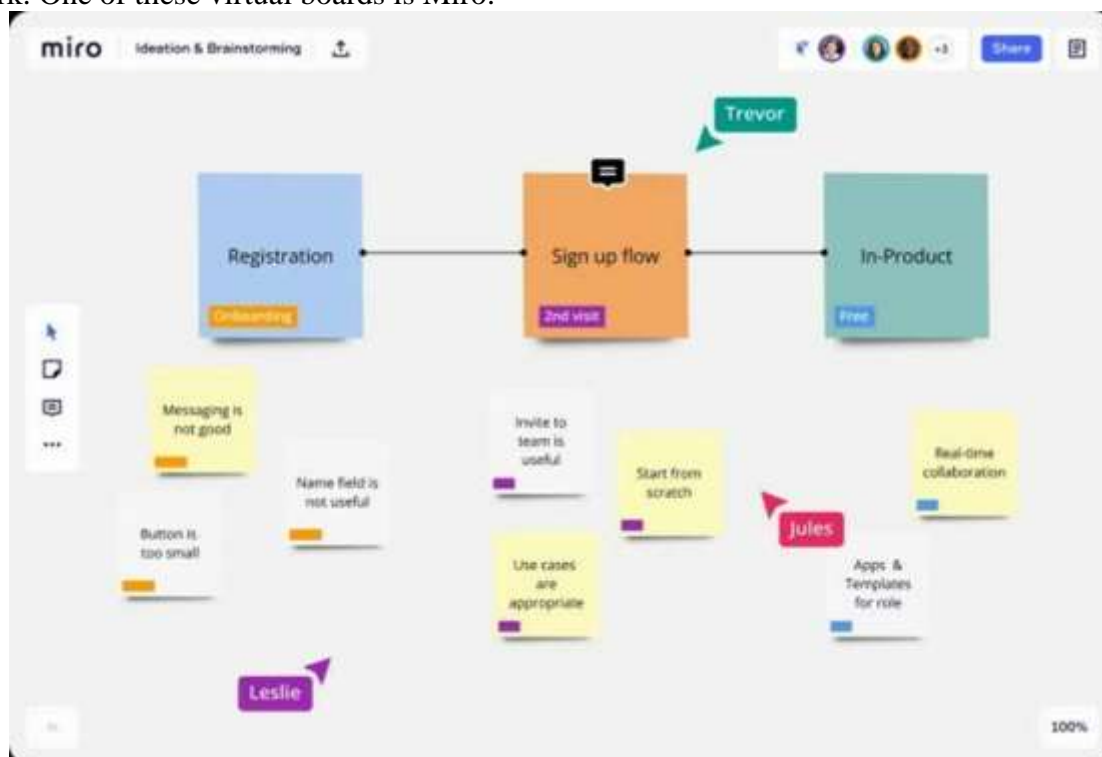
- performing laboratory work close to research activities;
- there is no strict time limit for separate laboratory work;
- the possibility of obtaining consultations in case of difficulties;
- the possibility of performing laboratory work in small groups, collective discussion of results, exchange of experience;
- availability of various tasks for laboratory work.

The means for performing laboratory work during distance learning in physics must meet the requirements:

- models of laboratory installations should be clear and safe;
- virtual laboratory installations should be interactive and ergonomic;
- instructions for laboratory work should contain a theoretical part sufficient for carrying out the work, as well as elements for activating the educational activities of students and schoolchildren.

It is convenient to use virtual whiteboards (AWM board, Whiteboard Fox, Concept

Board etc) to create a discussion of students in the classroom, or to organize group and team work. One of these virtual boards is Miro.



1. Figure- Initial view of the Miro board

We do next actions on Miro board:

- 1) attach text to the board, images, files of various types (pdf, ppt, etc.), stickers;
- 2) drawing, writing formulas manually;
- 3) Creating an intelligence map based on templates or "from scratch";
- 4) using kanban boards for project management (such as Trello speakers "new tasks", "at work", "done");
- 5) we can organize work on one board at a time in a team.

Miro toolbar (located on the left)

Cursor for dividing objects. When you click, the "hand" that you can drag the field to changes. The hot key is "M"("V").

Select a template. Here are intelligence maps, algorithms, Kanban boards for projects. When you hover over the template, the "show preview" option opens, where you can see what this template will look like after filling in.

Add text. You can also add text anywhere by double-clicking.

Add a sticker. For the sticker, you can choose the color, size (S,M, L, or any other – pull out its edge), font size. To write something on the sticker, you need to double-click on it. In addition, you can add a link to the label, a tag (for example, with the name of the person who wrote it), and your students can also rate it with emoticons!

Figures. You can change their fill and control the text inside.

Arrows for adding objects. You can also add objects by clicking on any blue circle.

Features of working at Miro

There is no need to download and install Miro - you can work directly from the browser.

In the Free Tariff, you can create 3 boards for one account. If you need to create more boards, we recommend registering multiple accounts.

To add students to the board, click "share" in the upper-right corner and copy the link. Here you need to specify the login parameters-for example, you can add students to your group, and then they will be available for all your boards. For students, the service will be free of charge.

Watch the changes on the board-they will stand out.

Save the finished boards to Google Drive or download them in JPG, pdf formats.

Formats of work in Miro

1 interactive tutorial

Add all the lesson materials to the blackboard and use the screen display in ZOOM to guide students through presentations, tutorial sheets, drawings, and diagrams.

But first you need to download large documents.

Discussion or brainstorming

Miro can also be used for group work-for example, in the form of a discussion or brainstorming session. You can choose a template for this script in advance. For example, the brainwriting template itself will show you how to conduct a brainstorming session: for this purpose, students are advised to first write their own ideas, and then supplement the ideas of previous participants.

3 Creating a working project

In this case, Miro is used to teach students how to work on a project and manage its goals, objectives, and implementation steps.

Traditionally, the "must", "do", and "done" columns are created and task cards are added to them. The card contains the deadline, performer, links, and any other necessary information on the task.

In the program of the 8th grade, during the of the theme "Ecological influences of heat machines" pupils of the class are divided into groups of 2-3 pupils, in order to develop their creative abilities, suggest different topics and instruct them to prepare different color combinations for different life situations, organize an exhibition on a virtual blackboard, defend their group work, organize an exhibition of students in the form of a competition between groups, increase their motivation to classes, motivate them, contribute to the development of their different abilities. During this lesson, students learn that active communication between team members and teams also gives a positive result. Each lesson, in which interesting, difficult questions of students are told, wins both didactic and educational. Such classes form students' skills in analyzing the state of a problem, asking questions, as well as finding answers to them, and finding various ways to solve problems. It develops students' creative thinking.

Conclusion

To choose distance learning or full-time - largely depends on the student's interest in acquiring knowledge, his ability to self-study and motivation. Since it is difficult to control

how the material is assimilated and consolidated during online learning, the success of such studies is directly related to the responsibility and organization of the student.

On the other hand, full-time education requires constant involvement, attendance at lectures and working out knowledge in practice, so it is not suitable for busy people with a permanent job.

Both full-time and distance learning have advantages and disadvantages. It is worth evaluating your capabilities and preferences, and then make a choice.

References:

1. Головин Ю. М. Физика [Электрон. ресурс]: Учебно-методический комплекс обучающихся по техническим направлениям подготовки и специальностям / Ю. М. Головин, О. С. Дмитриев, О. В. Исаева, И. А. Осипова, В. Б. Вязовов, В. М. Поликарпов, В. М. Холодилин. -Тамбов: Изд-во ФГБОУ ВО «ТГТУ», 2017. -153 с.
2. Осипова И. А. Моделирование процесса научного исследования на примере работы учебной лаборатории по нанотехнологиям / И. А. Осипова, О. В. Исаева // В сборнике: Виртуальное моделирование, прототипирование и промышленный дизайн. Материалы III международной научно-практической конференции: Электронный ресурс. Общая редакция: В. А. Немтинов. - 2016. - С. 272-276.
3. https://pedsovet.su/ikt/7077_obzor_online_dosok
4. Осипова И. А. Проектная деятельность как условие совершенствования эффективности непрерывной системы образования школа-вуз \ Осипова И. А., Исаева О. В. // Современные технологии в науке и образовании - СТНО-2020. Сборник трудов III международного научно-технического форума: в 10 т. - Рязань, 2020. -С. 15-19.