SMART TECHNOLOGIES - AS A SYSTEM OF ADVANCED TECHNOLOGIES FOR TEACHING OPTICS IN ENGLISH

Polatuly S.,
PhD-student, Khoja Ahmet Yassawi International Kazakh-Turkish University, Kazakhstan, Turkestan
Tolebayeva A.,
master's student, Khoja Ahmet Yassawi International Kazakh-Turkish University, Kazakhstan, Turkestan
Zhumatova A.,
master's student, Khoja Ahmet Yassawi International Kazakh-Turkish University, Kazakhstan, Turkestan
Ramankulov Sh.
PhD, Ass. Prof. Khoja Ahmet Yassawi International Kazakh-Turkish University, Kazakhstan, Turkestan

Abstract

In the development of the training of future physics teachers in English, it is of great importance to conduct practical classes in optics using SMART technologies. Especially when organizing a lesson using digital technologies, the continuity of heuristic methods contributes to mastering the topic in English. The use of SMART technologies in solving physical problems, teaches students to work independently with computer models, adapts them to perform task analysis graphically. Allows you to find solutions to the problem in other ways. In this article we will look at the methodology of solving problems in English in practical classes. Problem solving uses students' subject knowledge when solving problems in English. The publication of optics problems presented in English allows students to master the methods of activity, replenish knowledge and apply them in life using the results of physical research on types of movements.

Keywords: teaching optics, English, SMART technologies, advanced technologies, content of training, solving problems.

Introduction

An important role in achieving the main strategic goals of the new modern education system in the teaching of individual disciplines, chapters in the field of physics in higher and secondary educational institutions is played by the use of technology. At the same time, for the rapid growth of scientific and technological progress, there is a need for new training methods in the training of high-level specialists.

After analyzing the literature [1-3], we were convinced that with the development of society, the territory of phenomena studied in the discipline of optics expanded over time, and only the development of the optics chapter influenced the development of many fundamental scientific studies, the development of basic physical views, and especially the discovery of discoveries in a new direction in physics. Given the lack of laboratory equipment in understanding some phenomena in the chapter "geometric optics", it is known that informatization of knowledge, especially SMART learning technology, plays a special role in teaching students [4].

Explaining to students through the demonstration of the chapter "geometric optics" - from world and domestic experience, we are convinced that this direction is relevant in the field of Education. However, a review of the literature in the direction of evaluating learning outcomes during training by animating, it was revealed that there is a contradiction between the active use of smart learning technologies and the lack of sustainable methods for assessing the effectiveness of learning outcomes in this form of training. The resolution of this contradiction is the main idea of our research.

Research methodology

During the work, a study was conducted using several types of methods:

Theoretical methods (analysis of the object and subject of research, comparison of alternatives, presentation of hypotheses, etc.);

Empirical research method (control of the educational process, experimental training, quality control of mastering, etc.);

Theoretical significance of the study: it shows how effective it is to evaluate students ' knowledge through smart learning technology, due to the lack of equipment for laboratory or other tasks and their implementation, in a deeper study of some chapters of physics. This means that the degree to which the child acquires knowledge or acquires the necessary values and skills is reflected in the implementation of individual and group didactic tasks. The result is the first function of the formative assessment. At the same time, it is necessary to constantly provide constructive and effective feedback or create a supportive environment to promote the student.

Results and discussion

Nowadays, the traditional educational process, both for learners and for teachers, is faltering with sustainable education, and the rapid development of our universe can be seen in the technological advances that are entering our lives in this last decade. This means that our technologies have entered our lives in ways that we did not think, and as a result of digitalization, three revolutions in physical science have led to a radical change. Also now we will see the fourth revolution in all aspects of our life: including the automation of our

university with digital technologies. Because in the future, we will train competitive students who are well versed in new technologies, can think creatively, have an intellectual, professional, moral, spiritual and many other human qualities [5-6].

Smart technology contributes to the solution of many important problems. In particular (fig.1.):

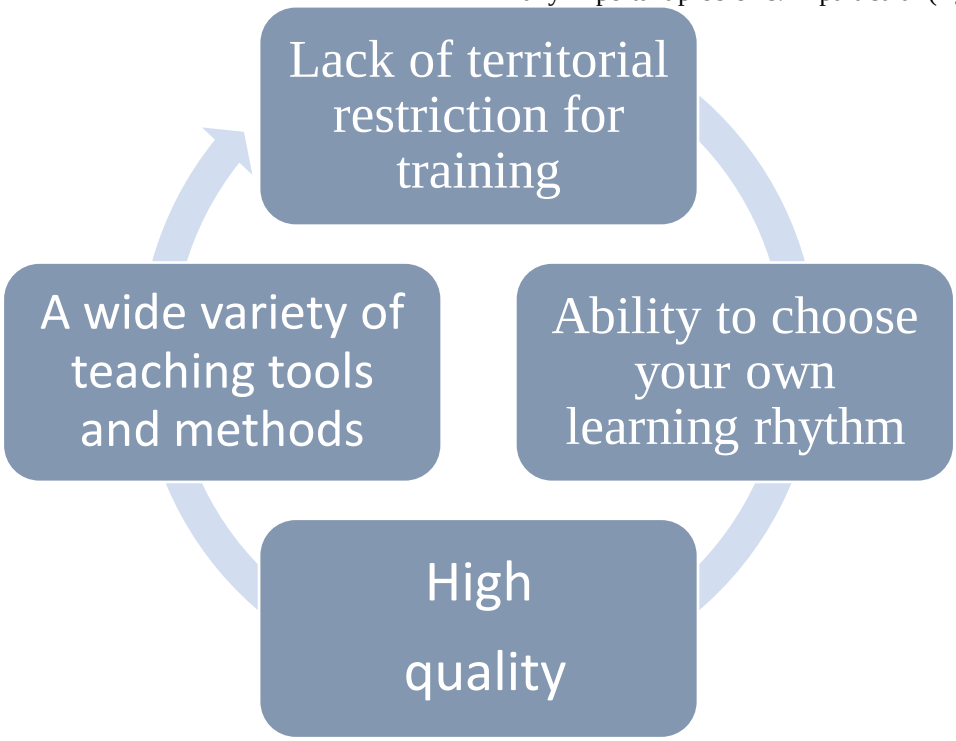

Fig.1. Features of using SMART technology

Using smart technologies in teaching the chapter "geometric optics", you can create a stream of such tasks:

- Creating virtual experiments using smart technologies; this is a kind of rational task that is performed in laboratory work, due to the scarcity of equipment;
- computer-checking the answer when performing tasks that require accurate calculation, first of all, students perform the task assigned to the page, calculating the answer with the help of computer programs. When compiling such tasks, it is necessary to correctly set the numerical parameters of the object that needs to be modeled, correctly select the ranges of changes, the multifunctionality of the orientation;
- practical tasks, solving-a group of tasks performed by the necessary computer programs;
- work on a given text or task, with more or less data; (in the process of completing this task, the student must find the desired parameter when completing the task);
- tasks that form creative-creative skills ;
- research training - a task in which students must conduct a stream of special software experiments that allow them to refute and confirm certain conclusions;
- problem-learning tasks-analysis of problematic situations during the lesson with the help of situational questions.

Problem 1. A person 1.7 m tall is approaching a street fan hanging at a certain height h at a speed of 1 M/s. After a certain period of time, the length of the human shadow was 1.8 m, and after 2C, its length was 1.3 m. find out at what height the street lantern stands?

In the process of solving this problem, the teacher uses the electronic textbook "physics training video course" to develop students ' thinking skills, improve their ability to analyze, solve a new problem, and develop creative qualities.

We select "Report 1" in the electronic textbook. At this point, the report is reported in a sound state. With this, students write down the given in their notebooks, and one student performs it on the blackboard, the rest of the students, under the guidance of their teacher, conduct an analysis of it. At this point, the teacher throws the following question to the environment:

"now imagine." Consider this person your own. Describe the situation. That is, write down the condition of the report and draw a diagram of it?!

Students draw a diagram of the report so that the condition of the report is further understood. We will continue to use the electronic textbook in drawing up the report diagram.

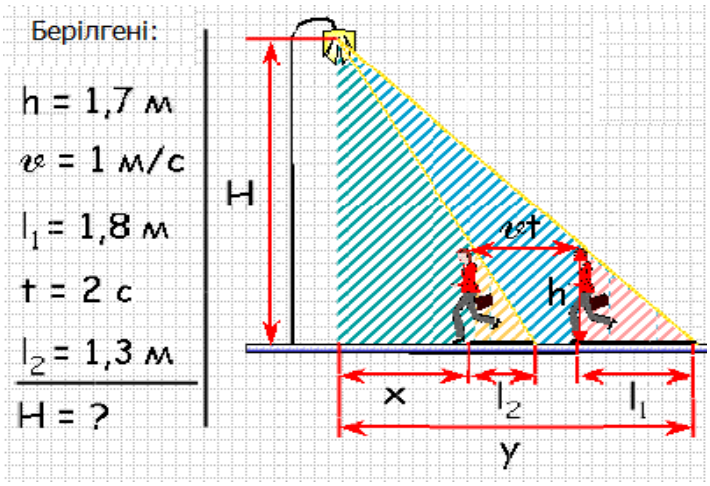

Fig. 2. Computer model of the problem

Then the analysis is carried out and the formulas necessary for the report are analyzed. Students ' opinions are heard in solving the problem.

The use of such a method by the teacher in solving the problem increases students ' abilities for independent work, arouses interest. This is because the student can analyze the problem through an electronic textbook, using the obstacles encountered in solving the problem. In the electronic textbook, reports are displayed on the screen by writing them in turn. This allows the student to stop writing on the screen at any moment and analyze it himself.

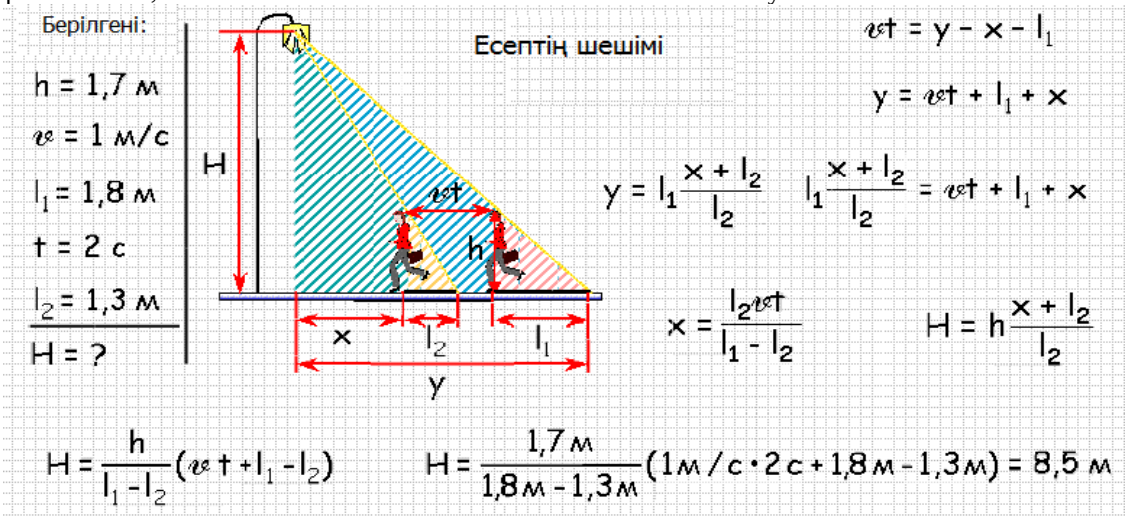

Fig.3. Model of sequential interpretation of the solution of the problem

Laboratory work can be used as an additional tool for future physics teachers in solving problems in English.

For example, a teacher begins practical classes by brainstorming with questions of a laboratory nature. The teacher's skill lies in the ability to analyze the problems that need to be solved by students by bringing them to the environment of various situations. This is where the brainstorming begins, with questions related to the following topic:

1. explain how the description of the image of this thing changes if we bring something closer to or away from the collecting lens?

2. explain how the description of the image of this thing changes if we bring something closer to or away from the scattering lens?

Here, as an auxiliary tool, the teacher brings the model "thin lens" (figure 3) from the program "open physics 1.1" to the surface of the interactive whiteboard. On the surface of the Model, A collecting or scattering lens can be placed alternately, and through that lens, with the object from which the image is obtained(red color), its image (black color), the Rays necessary to obtain the image(yellow color) are depicted.

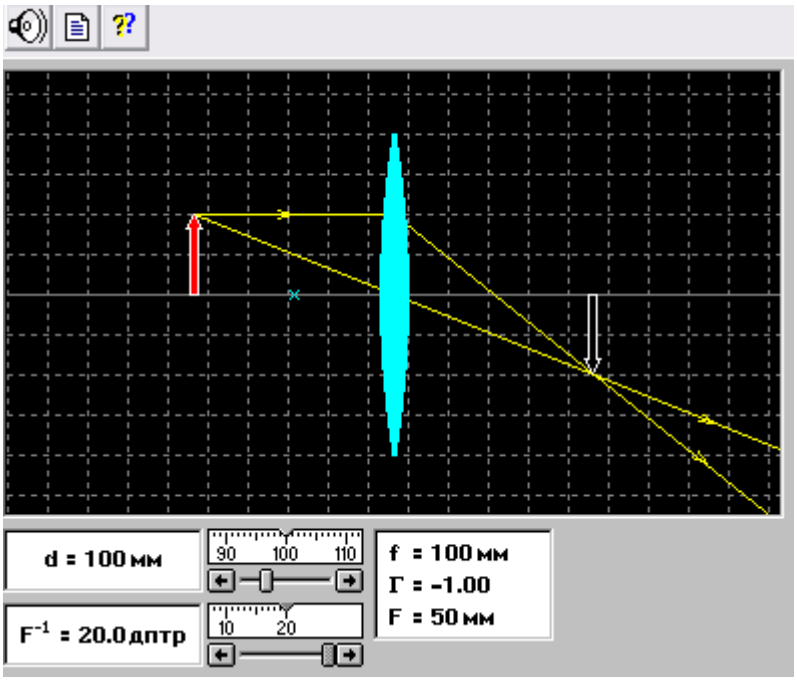

Fig.4. Image model in thin lens

Students remember that two rays are enough to draw an image of each point from this picture. From the many rays emanating from a given point, the simplest Rays are selected, so they can be easily reproduced in the process of drawing an image. These rays:

1) the center of the lens is a beam passing through the optical outgrowth. This beam does not change direction as it passes through the lens;

2) a beam passing parallel to the main optical growth of the lens. After the lens is broken, either itself passes through the head focus, if the lens collector, the stretch, if the sprayer.

A group discussion is organized between students. The thoughts expressed by the students are discussed with the help of the teacher. The lower part of the model contains regulators of the value of the distance (d) from the object to the lens, the optical strength of the lens (D or F-1). By changing these values, we see what is on the lower right page of the Model (f is the distance from the image to the lens, G is the linear magnification of the image).

Conclusion

In accordance with our research direction, the organization of the process of teaching physics in English is characterized by the following features:

- the transition to multi-subject communication through teaching physics in English allows students to transfer the methods of activity from one goal to more goals, fully master the educational process, to determine the full picture of the environment and nature;

- future physics teachers activate thinking activities from a large amount of problem situations in the process of teaching subjects in English, strive to achieve personal, competency-based learning results;

- teaching the subject in English allows future physics teachers to control the process of implementation of all actions, from the goal to the result, increases the amount of information in the educational process through the implementation of the metapposition position;

- teaching the subject in English allows future physics teachers to gain access to new factors that prove real observations in best practices, forming basic knowledge in the course of studying physics;

- teaching the subject in English contributes to the activation of educational and cognitive activities of future physics teachers;

- teaching the subject in English contributes to the development of creativity, creative thinking of future physics teachers, the ability to apply knowledge in any field of physics.

- teaching the discipline in English is the main source of education in culture, the development of personality traits, friendly to the environment and nature, individuals, life.

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