USE OF ROBOTICS ELEMENTS IN TEACHING PHYSICS

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Annotation:
This article deals with the problem of using elements of robotics in the educational process of physics in higher military education.

Keywords: elements of robotics, educational technology, the study of physics, robotics in teaching and physical practice, training modules in robotics, educational projects in robotics.

It is necessary to use the elements of robotics in higher military educational institutions for the innovative change of the environment of modern technology and the renewal of the technical activity of society, as well as for the further improvement of the use of robotics in military fields. It is possible to develop scientific and technical activities of future defenders of the homeland through the use of robotics elements in higher military educational institutions. As a result of using polytechnic education, their technical knowledge related to innovations is formed.

Elements of robotics have been used in the world education system for 15 years. Robotics education is considered as a means of forming the engineering thinking of cadets and students of the higher military educational institution, getting them interested in creativity and applying it in practice, increasing their interest in engineering activities, professions and specialties.

For the development of robotics education, the following sufficiently complex educational issues should be put before the higher military educational institution:

1. Updating the resources of polytechnic learners, taking into account the direction of technical innovations such as robotics;
2. Organization of introducing innovations into the industry using robotics elements;
3. Organization of conducting a number of scientific and research works aimed at the development of robotics education [1].

Knowing the basics of robotics should be one of the main links of education for cadets and trainees of higher military educational institutions, and should also be included in the curriculum. Such reforms are being implemented in a number of developed countries of the world. For example, in the higher military educational institutions of the USA and Great Britain, preparing cadets and trainees for the development of technical projects with the help of robotics is considered a promising task.

Competition-based robotics is developing day by day in our country, thematic events are being held and mostly young people who are engaged in technical creativity participate in them. But the number of participants among cadets and trainees of the higher military educational institution is significant.

The generalization of the results of research conducted by L.G. Beliovskaya, D.G. Koposov, V.N. Halamov and others allows to see robotics as a special educational technology. This technology structure consists of 3 components:

1. As an object of study;
2. As a learning tool;
3. As a means of increasing the creativity of cadets and listeners.

The use of robotics elements in the teaching of physics in higher military educational institutions was experimented for the first time at the higher educational institution in the city of Ferm of the Russian Federation. The experience was related to the study of robotics in the field of applied technical knowledge. The experience lasted for 3 years. Based on the experience, thematic educational modules were developed and included the following educational materials:

1. Learning the elements of robotics through physical foundations;
2. Carrying out physical experiments using robotics elements;
3. Creation of robotic technical object models as physical and technical applications;
4. Carrying out robotic laboratory work at various levels;
5. Organization of project work on robotics.

Each module includes theoretical information, instructions, methodological recommendations, as well as photo and video materials on assembling robotic devices, computer programs. Each element of the module is inextricably linked with the science of physics and is aimed at expanding and deepening the knowledge of cadets and listeners in science.

It will be necessary to develop a curriculum as an object of learning robotics in the educational process. The structure of such programs is divided into 2 contents:

1. System of knowledge about robotics;
2. Experience of educational activities in accordance with the system.

In the first part, it is necessary to consider the physical operation of ready-made robotic systems at different stages of practice, while in the second part, it is necessary to study the main elements of the technology of applying robotic technologies. The second content provides for the formation of basic skills in designing and constructing robots with a simple structure and making them [2].

The above-mentioned content should become an object of study within the framework of various subjects of the curriculum (physics, mathematics, informatics, etc.). The role of physics in the study of robotics by cadets and students can be analyzed as follows:

1. Physical principles of the functions of robotics elements and the possibilities of higher military educational institutions in their study;
2. Physics laboratory experiment organized on the basis of robotics elements

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