

USE OF INFORMATION TECHNOLOGY IN THE TEACHING OF GENERAL (TECHNICAL) SCIENCE

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Annotation: *The article describes the experience of using information technology in teaching technical mechanics to students.*

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INTRODUCTION

Information technology (IT) - processes, methods of searching, collecting, storing, processing, providing, distributing information and methods for implementing such processes and methods [1]. The history of information technology development reached its peak after the creation of a personal computer in 1981 [2]. The main information technologies used in education are shown in Figure 1 [2–4]. In the traditional learning process, Zaitseva S.A. identifies the following contradictions [3]: - the activity of the teacher and the passivity of the student; - the curriculum is designed for the average student; - lack of an individual approach; — information is presented in an abstract-logical form; - insufficient attention to the development of students' creative abilities; - a strictly regulated list of disciplines studied; - limited time, etc.

MATERIALS AND METHODS

Among the advantages of information technologies in education, the most significant are [2–4]: — the active position of the student; - the transition of the process of cognition from the category of "teach" to the category of "study" the subject consciously and independently; - information richness and flexibility of teaching methods using ICT; - high efficiency of knowledge acquisition; - increasing the visibility of training; — optimization of the learning process; - "immersion" of the student in a special information environment that best motivates and stimulates the learning process; — interactive links with various educational resources (libraries, reference books, dictionaries) and educational communities (teachers, consultants). Special opportunities for teachers appeared with the introduction of presentations into the educational process. In presentations for technical mechanics classes, you can show text slides, kinematic diagrams, photographs of the objects under study, animations and videos, which significantly increases the clarity and clarity of the learning process.

RESULTS AND DISCUSSION

Videos and animations (3D models) of objects can be used from the Internet or developed by teachers together with students and software engineers of the school. The use of animation during the lesson allows you to visually show the device of the object under study, the sequence of its disassembly and assembly,

the principle of operation and the processes occurring inside the parts. Currently, the department has developed an animation of a cylindrical single-stage gearbox, which is used in the study of gears. The interactive whiteboard allows you to both demonstrate presentations and perform kinematic diagrams of mechanical transmissions, write formulas, and highlight important information during practical and laboratory classes. When performing kinematic schemes of mechanical transmissions, their high quality is ensured due to the software functions built into the interactive whiteboard. The use of licensed programs APMWinMachine and Columbus allows you to conduct practical exercises on the design calculation of mechanical transmissions and virtual laboratory work on the strength of materials. The APMWinMachine program allows you to carry out design calculations of mechanical gears, obtain kinematic diagrams (drawings) of gears in electronic and printed form, and also conduct studies of the influence of various parameters on the characteristics of mechanical gears. Using the Columbus program, you can conduct virtual laboratory work on testing various materials for tension, compression, torsion and bending. The use of the Columbus program allows you to reduce the cost of testing samples from various materials. Internet resources can significantly increase the effectiveness of teaching the discipline "Technical Mechanics". Internet resources contain text documents on the academic discipline, photographs, videos and animations. The main task of the teacher is the skillful use of Internet resources in the process of teaching technical mechanics to cadets, as well as in methodological and scientific activities. Computer tests in technical mechanics are developed for all sections (modules) of the discipline. Teachers conduct computer testing of students during classes in display classrooms, as well as during practical and laboratory classes using a laptop.

We pay special attention to the site on the discipline "Technical Mechanics". The site was created using the free Wix website builder. The site contains the following educational materials in pdf format: thematic plan; educational and methodological developments; assignments for settlement and graphic works; samples of settlement and graphic works; study guides; laboratory workshop and workshop on the calculation of mechanical transmissions. Any cadet from his smartphone (tablet) can go to the site of the discipline "Technical Mechanics" during self-study hours or in private time and prepare for the upcoming lesson. The electronic didactic complex, developed according to the academic discipline, duplicates the content of the site and is issued to students at the first lecture. The university has a system of electronic resources, which contains electronic publications on the discipline "Technical Mechanics". Electronic recording of the progress of cadets was introduced in order to control the progress of the management of the university in all disciplines. The electronic journal on technical mechanics is filled out after practical and laboratory classes. The boundary control of knowledge is carried out at the end of each topic of the discipline. In the electronic journal, marks are also given for each month of training in the discipline.

Teachers of technical mechanics widely use their e-mail for individual consultations of students. With curators of groups on problematic issues of learning, teachers maintain mobile communications. The local information network of the university is used by teachers in all types of work. Students also have access to the local information network of the university from anywhere on the territory of the university. Guidelines, electronic publications and other materials are placed in the local information network.

Digital culture and digital literacy: Computer technologies and other aspects of digital culture have changed the ways people live, work, play, and learn, impacting the construction and distribution of knowledge and power around the world. Graduates who are less familiar with digital culture are increasingly at a disadvantage in the national and global economy. Digital literacy—the skills of searching for, discerning, and producing information, as well as the critical use of new media for full participation in society—has thus become an important consideration for curriculum frameworks.

In many countries, digital literacy is being built through the incorporation of information and communication technology (ICT) into schools. Some common educational applications of ICT include:

- One laptop per student: Less expensive laptops have been designed for use in school on a 1:1 basis with features like lower power consumption, a low cost operating system, and special re-programming and mesh network functions. Despite efforts to reduce costs, however, providing one laptop per child may be too costly for some developing countries

- Tablets: Tablets are small personal computers with a touch screen, allowing input without a keyboard or mouse. Inexpensive learning software (“apps”) can be downloaded onto tablets, making them a versatile tool for learning. The most effective apps develop higher order thinking skills and provide creative and individualized options for students to express their understandings.

- Interactive White Boards or Smart Boards: Interactive white boards allow projected computer images to be displayed, manipulated, dragged, clicked, or copied. Simultaneously, handwritten notes can be taken on the board and saved for later use. Interactive white boards are associated with whole-class instruction rather than student-centred activities. Student engagement is generally higher when ICT is available for student use throughout the classroom.

- E-readers: E-readers are electronic devices that can hold hundreds of books in digital form, and they are increasingly utilized in the delivery of reading material. Students—both skilled readers and reluctant readers—have had positive responses to the use of e-readers for independent reading. Features of e-readers that can contribute to positive use include their portability and long battery life, response to text, and the ability to define unknown words.

CONCLUSION

Thus, at present, in order to meet the needs of students in obtaining knowledge, the teacher must master modern educational technologies, and, taking into account their development, constantly improve their information culture through self-education, but at the same time not abuse the use of these technologies in their practice. and be creative with everything. The means and forms of media education provide the teacher with opportunities for professional growth and self-improvement through the use of the latest achievements of science and modern technologies. Also, information technology greatly increases the motivation of people to learn, conduct various research projects, experiments, create innovative projects and articles. In our 21st century of computers, the use of information technology in education is a necessity that can prepare students for life and work in the modern information space. An advanced teacher is obliged to constantly engage in self-education and the study of innovations in pedagogy.

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