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METHODOLOGICAL BASIS FOR TEACHING PROGRAMMING LANGUAGES IN PROFESSIONAL EDUCATIONAL INSTITUTIONS

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Abstract
General and methodological approaches are considered and described depending on the specifics of teaching programming languages in professional educational institutions.

Keywords: professional educational institutions, programming languages, approaches, teaching methods.

Create ample opportunities for training young people who want to acquire modern knowledge and acquire a profession in demand on the labor market, encourage the younger generation to develop their intellectual and professional skills and support them. , as well as a number of new initiatives and ideas for the training of specialists in the field of information technology. In particular, it is important to improve the skills of specialists studying in vocational schools, colleges and technical schools of our republic in the field of information technology. In this case, it is necessary to pay special attention to teaching programming languages.

Programming languages are languages used to create computer programs, web applications, games, and other software products. Today it plays an important role in the development of society, so educational institutions around the world offer courses on its study.

Various vocational schools may use the following approaches to teaching programming languages, depending on the level of preparation of students and the characteristics of the curriculum.

1. Lectures and seminars are a traditional form of education when a teacher introduces students to the theory of a programming language and gives assignments for self-study. This form of education allows students to acquire the necessary knowledge to work with a particular programming language. Practical exercises can be used as an addition to lectures and seminars for the practical application of knowledge.
2. In practical classes, students solve problems that help them learn to program in the target language. Hands-on activities include programming exercises, building

console applications, developing web applications, and more. Practical exercises can also be used to reinforce the theory learned in lectures and seminars.

3. Course and diploma projects allow students to perform practical programming tasks and demonstrate their knowledge and skills. Course projects can be used to reinforce knowledge about a particular programming language, and graduation projects can involve building a real software system. This form of learning helps students gain experience of working in a team and see the end result of their work.

4. Some educational institutions offer online programming language training. Students can complete some assignments and video lessons in their free time and take the course depending on their ability. Online courses may be more flexible for students who cannot attend lectures and seminars at a professional school.

5. In individual lessons (or subject groups), students can contact the teacher for individual advice and help in learning programming languages. This form of education allows students to receive an education tailored to their specific needs.

6. Thus, the variety of forms of teaching programming languages in vocational schools is aimed at providing students with various ways to acquire knowledge and skills and choosing the best approach depending on their level of knowledge and needs.

7. Teaching programming languages in vocational schools is based on methodological approaches that allow students to effectively and systematically master programming languages.

Below are the main methodological approaches used in teaching programming languages in vocational schools.

1. The principles of "top down" and "bottom up". Top-down and bottom-up are two opposing approaches to learning programming languages that focus on a systematic and efficient learning process.

The top-down principle suggests that the study of a programming language begins with the study of its general concepts and principles. Students are shown how to apply these concepts and principles to various code examples and problem solving. Thus, the main idea of this principle is that the study of a programming language begins with its general principles, and only then the student proceeds to study more detailed aspects.

For example, when learning the Python programming language, students start by learning basic concepts such as variables, conditional statements, loops, etc. Then they solve practical problems that correspond to the concepts they have learned.

The bottom-up approach, in contrast, assumes that students start learning a programming language by learning specific language constructs and code examples,

and then move on to learning general concepts. This principle is useful for students with programming experience who want to get started right away with practical examples.

2. Active participation of students - the process of creating conditions that encourage students to participate in the active life of an educational institution. To achieve this goal, we can recommend the following activities aimed at developing interest and enthusiasm among students, as well as improving the quality of the educational process:

- Sports competitions, fitness classes and other sporting events;
- Cultural events - concerts, theatrical performances, exhibitions;
- Conferences, seminars, lectures by invited experts; Volunteer and charitable projects;
-Thematic evenings, festivals, holidays;
- Educational programs - courses, master classes;
- Science Olympiads;
- Scientific circles;
- Scientific quizzes;
- Interest clubs - cinema, music, dancing, literature, etc.

These and other events help create an atmosphere of interaction and communication between students and teachers, arouse interest in learning and the life of an educational institution.

3. Distance education technologies are a set of methods, technologies, programs and tools used for learning and sharing knowledge and experience via the Internet.

Distance learning technologies include:

- Web conferences and webinars is a special software that allows you to conduct simultaneous online meetings, lectures and seminars for multiple users;
- Videoconferencing is a technology that allows users to connect to a general conference using webcams and communicate with other participants;
- Electronic textbooks and online courses are digital versions of educational materials that can be downloaded to a computer or mobile device; e-mail is a means of communication between the teacher and the student, as well as course participants;
- Learning Management Systems (LMS) - a set of software and hardware tools that allow you to create and manage training and courses;
- Electronic tests and control are specially designed programs that allow you to check and control students' knowledge;
- Chat and forums are electronic platforms designed to communicate and exchange ideas with participants in online courses.

All these technologies and tools greatly simplify and accelerate learning and knowledge sharing, making learning accessible to a wider range of users, regardless of time and place. 4. An integrated approach to teaching programming languages is an approach that includes the use of various methods and teaching aids, for example:
- Theoretical lectures on the basics of the programming language, including the analysis of terms, syntax, methods and algorithms;
- Practical classes in which students must solve problems, write programs and complete projects using a programming language;
- Seminars where experienced programmers give students the opportunity to observe their work, show code examples and share experiences;
- Online courses and tutorials are available on various educational platforms and online. These courses and tutorials may include video tutorials, assignments, quizzes, and more;
- software tools that allow students to independently write and debug code, create programs and games;
- Social learning networks and forums where students can interact with other students and developers, ask questions and get answers.
Such a holistic approach allows students not only to acquire theoretical knowledge, but also to learn how to apply it in practice, develop programming skills, and communicate with interested colleagues.
5. Formation of programming skills in a team - a methodological approach used in teaching programming languages and based on the joint activities of students in a team. This approach allows students to develop teamwork, project management and complex problem solving skills.
Formation of programming skills in a team includes the following steps:
- Team building. At this stage, students are divided into groups according to interests and goals;
- Create a project. The teams choose a project to develop together. Each team member has a task; - Design and development of applications. The team develops a prototype of the program, determines the necessary methods and functions, design, interface;
- use of collective tools of labor. Teams can use various communication and collaboration tools such as git, Slack, etc.;
- Inspection and quality control. Students compare their tasks and work with other team members and mentors to share experiences and knowledge.
This approach allows students to explore various aspects of programming such as programming, design, interaction with other people, project management, and

programming languages. In addition, it develops students' communication, persuasion and interpersonal skills in a team.

6. Simulation in real life. Real life simulation is a methodological approach that involves using downloaded scenarios to create situations and problems that programmers face. This approach allows students to apply programming skills to specific tasks that may arise when developing software products, websites, applications, etc.

Real simulation when teaching programming languages includes the following steps:

- Studying the theory and foundations of the programming language. At this stage, students acquire the basic knowledge necessary to simulate real situations;
- Learning scripts. Students will study and analyze the proposed scenarios, their syntax, problem solving methods and approaches to developing code;
- Practical tasks. Students solve practical problems using downloaded scripts that are designed to prepare them for real programming tasks;
- Bug fixes and optimizations. After completing the assignment, students should analyze their code to find errors, optimize it, and improve performance; - Compilation and testing. After the students have studied and completed the tasks, they should create their own code and test it for errors and failures.

Real life simulations in teaching programming languages not only helps students learn the theoretical aspects of programming, but also helps them learn how to apply their knowledge and solve complex programming problems. In conclusion, we can say that methodological approaches play an important role in teaching programming languages in vocational schools. Each approach has its merits, and it is important to choose the one that best suits the specific curriculum and student needs.

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