

## ROLE OF SOFTWARE ENVIRONMENTS IN TEACHING TECHNICAL SCIENCES

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**Abstract.** *In recent years, the demand for skilled computer programmers in various fields has increased dramatically. As a result, the role of computer programs in the teaching of technical sciences became important and even came to the first place. This article highlights the effective integration of computer programming and the software environment into technical sciences, as well as the role of the software environment in teaching technical sciences.*

**Keywords:** *technical sciences, programming, software environment, integration, Python, C++, coding, computer, preference*

### INTRODUCTION

The 11th century is the century of high computer technologies. Therefore, at present, organizing the educational process based on modern information and communication technologies is one of the most urgent issues. The main goal of the application and use of information and communication technologies in education is to create new opportunities for all participants of the educational process, that is, those who receive education and those who provide it. In the application of information technologies to the educational process, the issue of finding forms and methods that improve the content of education is important. One of the main goals of the pedagogic staff is to deliver the planned educational materials to each student and to achieve an increase in their level of mastery. Therefore, lecture classes should be characterized by the simplicity of explaining the topics and the ease of acceptance. Lectures should cover all the questions related to the study materials on the topics and they should be chosen very carefully. For each subject to be taught, its content is usually selected according to the established purpose. The use of this information technology in technical sciences is directly related to the programming environment. In the current digital age, computer programming has become an integral part of technical sciences. The ability to code not only

empowers individuals with highly in-demand skills, but also opens up a world of opportunities for innovation and problem solving.

### **LITERATURE ANALYSIS AND METHODS**

There are several ways to effectively integrate computer programs into engineering programs. First, institutions may offer specific courses or modules that focus on teaching programming languages such as Python, Java, or C++. These courses can be tailored to the specific needs of different industries, allowing students to learn programming concepts and techniques directly relevant to their chosen career field.

Hands-on projects and hands-on assignments can be incorporated into the curriculum to provide students with real-world experience in applying programming skills. For example, in an automotive technician program, students may work to create software simulation or coding solutions for common vehicle maintenance tasks.

In addition, collaboration with industry partners and experts can greatly enhance the integration of computer programming into technical education. Lectures, workshops, and internships can introduce students to real-life applications of programming in a variety of fields. It not only provides valuable insights but also helps to bridge the gap between academic knowledge and industry expectations.

In general, it is essential that educational institutions provide adequate resources and support for teachers and students involved in learning computer programming. This includes access to relevant software tools, online learning platforms, coding libraries, and supportive learning environments that encourage experimentation and problem solving. Let's consider a hypothetical example to illustrate the importance of computer programming in engineering. For example, a student is pursuing a vocational training program in mechanical engineering. As part of his coursework, he will learn to write programs that automate various processes involved in the design of complex machines. By applying their knowledge of coding, students can create algorithms that increase efficiency and accuracy in the design process. This example shows how computer programming can be a powerful tool in the field of technology, allowing students to optimize their work and achieve better results. Thus, software environments in the teaching of technical sciences provide the following results:

**Facilitates Automation:** Computer programming can automate tasks, saving time and reducing human error.

Improves Problem Solving: Programmers develop critical thinking skills in solving logic puzzles and debugging code.

Encourages creativity: Coding encourages students to think outside the box and come up with innovative solutions to real-world problems.

Encourages Collaboration: Working on coding projects often involves teamwork, fostering effective peer-to-peer communication and collaboration.

In addition, students will have the following advantages:

Advantages of computer programming	Examples
Improves efficiency	Automation reduces manual labor
Enables innovation	New software applications solve pressing social problems
Increases employment opportunities	There is a high demand for skilled programmers in various fields
Stimulates economic growth	Technological progress leads to increased productivity

**Problems in teaching computer programming in technical sciences.**

One of the common challenges faced in teaching computer programming in engineering is the diversity of prior knowledge among students. Some may have a strong foundation in coding, while others have exposure or experience. In order to solve these problems, it is necessary to consider the implementation of differentiated educational strategies that correspond to different skill levels of teachers. For example, more programming applications can be run. Another obstacle teachers face is the rapidly evolving technology and programming. As development continues at an exponential rate, it can be overwhelming for educators who are responsible for producing and uploading curriculum to stay relevant. One of the solutions is to establish cooperation between education and industry experts.

**RESEARCH METHODOLOGY**

During this research, methods such as scientific observation, tables, systematic analysis, and comparison were used.

**RESULTS**

In today's rapidly developing technological environment, computer programming plays an important role in professional education. We can see this importance in the following technical field. Students studying mechanical engineering may be required to design and develop a

prototype of an automated manufacturing system as part of a practical training module. Using their knowledge of computer programming languages such as Python and C++, students were able to write code that controlled various components in the system, allowing them to function seamlessly.

There are several advantages of including computer programs in engineering subjects:

**Advanced Problem Solving Skills:** Learning to program allows students to think logically and break down complex problems into smaller manageable tasks. This analytical thinking develops effective problem-solving skills that can be applied across disciplines.

**Increased employability:** In today's job market, there is a growing demand for individuals with programming skills. Incorporating computer programs into vocational education equips students with valuable competencies that make them more attractive to potential employers.

**Innovation and creativity:** The ability to code opens new avenues for innovation and creativity. Students studying programming can learn new ways to integrate technology into their respective fields, leading to increased achievement and productivity.

**Collaboration Opportunities:** Computer programming often involves working in teams or collaborating with different professionals. Through group projects, students not only improve their coding skills, but also develop important teamwork and communication skills.

### CONCLUSION

Integrating computer programming into engineering is critical to preparing students for success in today's digital world. By providing them with opportunities to learn coding skills and apply them in practical settings, educational institutions equip their students with a competitive edge and prepare them for future career advancements. Using computer programming as an integral part of professional education programs ensures that graduates are well equipped to succeed in industries where technological skills are increasingly valued.

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