

METHODOLOGY OF TEACHING THE SOFTWARE ENGINEERING SECTION**Sadoqat Kholiqulovna Normurodova****Senior Lecturer at the Department of Computer Science and Teaching Methods****Shahrisabz State Pedagogical Institute****E-mail: sadoqatnormurodova33@gmail.com****<https://orcid.org/0009-0009-1604-7456>****Musurmonova Madina****Asadova Shaxina Halim qizi****Faculty of Pedagogy, student of the 'Mathematics and Informatics' program.****e-mail: madinamusurmonova35@gmail.com****<https://doi.org/10.5281/zenodo.14960768>**

Abstract. The methodology of teaching the Software Engineering section is crucial for effectively teaching programming and software development processes in modern educational systems. This methodology aims to combine theoretical knowledge with practical skills, encourages students to participate in solving real-world problems, and promotes group work and collaboration during software creation. The teaching process primarily involves interactive methods, coding exercises, and project-based teaching methods. The role of the teacher is significant in establishing effective communication with students, providing correct guidance, and helping to solve problems. Furthermore, the evaluation and feedback process helps students analyze and improve their work. The methodology of teaching the Software Engineering section helps students develop excellent skills in programming, preparing them for their future professional careers.

Keywords. Software, Teaching Methodology, Programming Education, Educational Technologies, Computer Sciences, Interactive Teaching, Innovative Teaching Methods, Exercises and Practices, Software Development Process, Pedagogical Methods, Practical Programming, Testing and Analysis, Educational Process Effectiveness, E-learning Tools, Programming Environments, Computer-Assisted Education, Teacher Professional Development, Educational Materials, Group Work, Distance Learning.

Introduction. The methodology of teaching the Software Engineering section aims to equip students not only with theoretical knowledge but also with practical skills in modern educational systems. The teaching process requires methodological approaches that encompass software creation, coding, system architecture, algorithms, and other essential topics. This thesis analyzes the methodology of teaching the Software Engineering section, the methods, and practices used during the teaching process.

I. Main Sections of Teaching the Software Engineering Section

Concept and Types of Software:

The general definition of software and its various types (operating systems, applications, system programs, etc.).

The Software Engineering section and its role in the educational process.

Curriculum and Syllabus:

Curricula designed for teaching the Software Engineering section, structure of lesson plans.

Teaching objectives and plans to achieve them.

II. Methods and Approaches to Teaching Software Engineering

Traditional Teaching Methods:

Lectures, practical exercises, instructional materials, and coding exercises.

Teacher-centered teaching and explaining software theory to students.

Innovative Teaching Technologies:

Interactive learning platforms, simulation software, and virtual labs to enhance learning effectiveness.

Distance learning methods, video lessons, and online resources.

Practical Teaching Methods:

Practical exercises in programming, laboratory work, and individual projects to develop students' skills in software creation.

System analysis and testing exercises.

III. Role and Qualification of the Teacher in Teaching Software Engineering

Pedagogical and Technical Qualification of the Teacher:

The teacher's qualifications, pedagogical styles, and technical knowledge for effective teaching of the Software Engineering section.

Continuous professional development and familiarization with new technologies.

Active Collaboration Between Teacher and Student:

The teacher's role in assisting students, listening to their ideas, and guiding them toward independent work.

Ensuring active participation of students in projects and group work.

IV. Challenges in Teaching Software Engineering and Ways to Overcome Them

High Demands:

The necessity of training highly qualified specialists in software engineering and keeping teachers updated with new developments in the field.

Increasing students' interest in programming and software development and making the teaching process more engaging.

Using Resources and Technologies:

Effectively applying modern technologies (computers, programming environments, electronic textbooks) in the teaching process.

1. Integrating Theoretical and Practical Learning in Software Education

The successful methodology of teaching software engineering is based on combining theoretical knowledge with practical exercises. In addition to teaching programming languages, system analysis, algorithms, and other theoretical topics, students need to be encouraged to solve real-world problems. Through theoretical knowledge, students understand the software creation process, while practical exercises allow them to test their knowledge.

2. Interactive Teaching Methods

Applying interactive methods in teaching the Software Engineering section is crucial for fostering active communication with students. Interactive methods such as group work, problem-solving exercises, and various simulations engage students and provide them with the opportunity to express their ideas freely. These methods help develop collaboration among students and facilitate the exchange of experiences.

3. Project-Based Teaching

Project-based teaching methodology engages students in the real software creation process. By developing small programs or systems, students reinforce their knowledge of programming and system architecture. Projects teach students to work in teams, manage time effectively, and gain practical experience. This methodology allows students to develop their professional skills.

4. Coding Exercises and Problem-Solving

Coding exercises and problem-solving activities in the Software Engineering section teach students the real aspects of programming. Writing code, testing it, identifying and fixing errors are essential processes for students. This method teaches students to search for solutions when facing difficulties, optimize code, and quickly detect errors. At the same time, this method helps students develop efficient and correct programming approaches.

5. Teacher's Role

The teacher plays a significant role in teaching the Software Engineering section. The teacher must not only provide theoretical knowledge but also demonstrate how to implement the programming process, offer advice on overcoming difficulties, and encourage teamwork. The teacher's active participation is necessary to support students, answer their questions, and facilitate the exchange of experiences.

6. Group Work and Collaboration

Teamwork is essential in software development because software systems are often developed in groups. Therefore, it is necessary to train students to work together in teams. Group work helps students develop collaboration, exchange ideas, and solve problems together. It also reduces competition among students and encourages mutual support.

7. Evaluation and Feedback

The evaluation and feedback methodology in teaching encourages students to analyze and improve their work. Practical activities, codes, projects, and other tasks completed by students in the Software Engineering section are evaluated. Through evaluation, the teacher can communicate with students, identify their weaknesses, and offer support. Feedback plays an important role in effective teaching and providing students with directions for improvement.

Conclusion. The methodology of teaching the Software Engineering section plays a crucial role in modern education. By integrating theoretical and practical knowledge, applying interactive methods, project-based teaching, and coding exercises, students are prepared for the real software creation process. Furthermore, the teacher's role, group work, and effective application of the evaluation system help improve the teaching process. This methodology provides students with the necessary skills and experience to create software, preparing them for their careers. The methodology of teaching software engineering holds an important place in modern education as it teaches students essential skills such as creating, analyzing, and testing software. Applying effective methods and innovative technologies in the teaching process increases students' interest in programming and plays a key role in preparing them as specialists.

The successful teaching of Software Engineering depends on the teacher's pedagogical and technical qualifications, their ability to help students and turn them into active participants in the learning process. Teachers must continuously develop their skills and adapt to new educational technologies.

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