

Improving Algorithmic Languages and Programming Course Teaching Methodology: Good Practices

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Abstract:

This article presents a number of innovative methods, practical tasks and recommendations for improving the methodology of teaching algorithmic languages and programming courses. This includes cooperation between the teacher and the students, that is, the teacher should interact with the students to learn algorithmic languages and programming. In order for teachers to effectively teach algorithmic languages and programming courses to students, the article includes practice, determining the purpose of the course, preparing interesting textbooks for students, developing innovative methods to strengthen practical exercises, choosing interactive textbooks, organizing students' practical work, strengthening courses, o Develop recommendations for strengthening students' well-learned programming languages, results and independent learning. The practices presented in the article will help teachers effectively teach algorithmic languages and programming courses.

Keywords: Algorithm, animation, Computer, digital, game, interactive, IT park, mentor, motivation, programming, practice, success, technology, traditional.

INTRODUCTION. Ensuring solid socio-economic development in the country requires implementation of the process of formation of information society, effective introduction and use of information technologies. The introduction of information technologies into all aspects of our economy, including the life of society, increases the efficiency of production and makes it possible to increase it several times. All types of information resources: software products, data banks and databases, other goods produced in the process of informationization are an integral part of

information technologies. Humanity is used to using the achievements of development, new technologies and ready-made products without thinking about how these innovations came to the world. We don't always think about how long and hard the developers went to make these products available to us. After all, scientific research is the foundation of painstaking research in these areas. Modern technologies are built on its basis. That is why countries with a developed level of informatization, modern manufacturing giants in the field of high technologies pay great attention to scientific and applied research. Strong scientific team and laboratory owners spend billions of dollars on these researches every year and get hundreds and thousands of patents. Today, our government is taking a number of measures to develop software products and their national market. In particular, great attention is being paid to the improvement of the legal framework, financial and economic, organizational, personnel and other aspects of this field. At the same time, it should be noted that the formation of scientific and technical potential in this direction is one of the important factors.

In the modern world, it is impossible to imagine life without information technology. They have firmly entered our lives, information technologies are used in all areas of human life, and play an especially important dual role. Information technologies reflect the accumulated experience of humanity in a format suitable for practical use. It also combines scientific knowledge and materialistic experience to implement social processes, while saving labor, time, energy and material costs [1].

Measures taken to increase the efficiency of the system of professional training and retraining in the field of information technologies create a solid foundation for providing state bodies and network organizations with qualified IT specialists [2].

The experience of developed foreign countries shows that the main wealth of any country consists of scientific, technical and intellectual potential. Today, there is a trend of combining intellectual and scientific and technical potential in order to develop the economy in the countries of the world. The Republic of Uzbekistan has a sufficiently qualified scientific, technical and technological production potential for the development of the software products industry. As for the domestic software industry, it should be noted that the uniqueness of this segment is that there is a great demand for qualified specialists. Despite the fact that the state and private sectors are paying great attention to solving this problem, this problem remains particularly urgent in Uzbekistan.

It is known that in order to solve a problem on a computer, first a copy of it is taken and an algorithm is created, then this algorithm is written in the form of instructions and commands that the computer can understand based on certain rules. When the resulting text is written in a computer language, it is called a program. So, a program is a sequence of instructions that a computer can execute to solve a problem [3].

A person lives inside algorithms all his life, but usually does not realize it. During his career, from the time he was born to the time he left the world, he always puts some problems in front of him and looks for ways to solve them. As a result, he comes up with certain rules and regulations, performs them according to the established order, and achieves the desired result. If a voluntary person succeeds in fulfilling these laws and regulations in the specified order, he can achieve the same results, and if he violates the order, the results obtained may not satisfy him. A set of rules or a sequence of actions designed to solve a given problem constitutes an algorithm of this problem [4].

The field of programming is one of the fastest growing fields today. Algorithmic languages and programming course provide great opportunities in the development of manufacturing and commercial fields. Today, a number of innovative pedagogical technologies are being developed to improve the effectiveness of learning and teaching algorithmic languages and programming. These include training courses, IT parks, websites, and mobile applications. This allows to improve the

methodology of teaching courses, to create understandable and effective textbooks for teachers. This article will give you some good practices to improve your programming course teaching methodology. You'll also learn how to share student feedback in each lesson and help the teacher develop with good demonstrations.

1. What are good practices for teaching an algorithmic languages and programming course?

It is important to learn good practices when teaching algorithmic languages and programming courses. These courses play a major role in teaching students the positive aspects of computer programming. A good methodology can greatly help students learn to think algorithmically, learn a programming language, and write code.

The most important thing is to organize practical training for students rather than theory. This gives students the opportunity to develop their skills in how to apply theoretical knowledge in practice and solve programming problems. Practical exercises help students learn and master problems.

Among other good practices, mentoring is important. Teachers play an important role in helping students master, support and develop them in the field of advanced programming. It is important for teachers to connect with students personally, understand their goals and motivate them.

In the current era of rapid development and automation and robotization of various processes, knowing programming and being able to use it in their work process is considered very important for students studying in technical and pedagogical fields. This is one of the most necessary requirements for modern professionals. The reason is that today, no one can deny that informatics can be successfully used in various fields [5].

An important part of teaching algorithmic languages and programming courses is learning and implementing programming languages. This is very important in preparing students to solve real-life programming problems. Practices and projects are a good way to help students develop programming skills and put them into practice.

2. Define course goals and objectives:

One of the most important steps in teaching programming courses is defining goals more clearly. The purpose of the course includes its own position for the instructors and students.

At this stage, the general purpose of the course, the results expected from the students and the amount of achievement of the course agreement should be determined. When the objectives are clear, the course design and teaching process will be easier to navigate and the course will be more useful to the students.

In the process of determining course goals and objectives, instructors and course writers must be successful in using them to engage students, increase motivation, and facilitate learning. Keeping track of learning objectives gives students a clear idea of what to expect and increases their interest in the course.

It also helps to determine the goals and objectives of the course, organize practical steps in course design and teaching. This stage is of great importance in increasing the effectiveness of the course.

3. Creating interesting and acceptable textbooks for students:

Creating interesting and acceptable textbooks for students is very important in teaching the course. Because textbooks that can motivate and interest students, facilitate the learning process.

It's important to use real-life examples, create interactive tutorials, and integrate news when creating engaging tutorials. For example, using new technologies, creating animations and games will help attract students' attention.

When creating engaging textbooks, you can increase student engagement and interest in learning by making them feel supported in their learning. Actively engaging with students' questions and ideas makes them feel acknowledged and valued. By creating such interesting and acceptable textbooks, students will enjoy the learning process more and contribute to the successful completion of the course.

4. Innovative methods for improving practical exercises:

Innovative methods for strengthening practical exercises are very important in improving the teaching methodology of algorithmic languages and programming courses. Compared to traditional teaching methods, innovative and proven methods to apply news and motivate students will be useful.

For example, interactive platforms and online textbooks help students to develop interactions. Strengthening knowledge through practices and solving production problems in programming will be effective for students.

Innovative methods such as working together, creating a team programming project, and implementing semi-automated tasks will help ge students new knowledge. These methods play an important role in motivating students and improving their learning abilities.

Also, giving advice to students during the learning process, listening to their opinion and encouraging their creativity is one of the powerful innovative methods. Such practices help students deepen their understanding and understanding and increase the level of mastery of the learning process.

5. Selection of interactive textbooks:

Selection of interactive textbooks is of great importance in improving the methodology of teaching algorithmic languages and programming courses. Textbooks should be purposeful for teachers and interesting for students. They should have interactive elements, such as tests, examples, or practical exercises to help students put their knowledge and skills into practice.

The choice of interactive textbooks has a motivating effect on students' learning. It increases students' interest and comfort patterns and makes learning easier and more effective. Interactive textbooks play a major role in creating an engaging and captivating learning experience for students.

In addition, making textbooks interactive increases student learning and understanding. They make concepts easy to understand through hands-on exercises and inspire students to put their skills into practice. Also, interactive textbooks help to create opportunities for teachers to monitor the learning process and evaluate the results of students.

6. Make textbooks that are convenient and easy to understand:

When making textbooks, it is very important that teachers use convenient and easy-to-understand methods to attract the attention of students. Students need to be motivated to study textbooks more effectively. To achieve this goal, it is recommended to use multimedia elements (video, audio, interactive elements). This method helps students understand and learn the content easily.

The structure of textbooks is also important to ensure convenience and ease of understanding when creating textbooks. Lessons are in the right order, and the topics are interesting and meaningful, which leads to students' understanding and interest. In addition, it will be useful to provide students with practical training and make changes to implement the most important concepts of the textbook.

Easy-to-use and easy-to-understand textbooks make students motivated and it can help students to understand more effectively and comfortably. Well-structured and meaningful textbooks enhance student learning and enjoyment of the learning process.

7. Ways of organizing practical work of students:

Ways of organizing practical work of students are very important in teaching algorithmic languages and programming courses. Practices are important for students to gain experience and make concepts more understandable by doing what they have learned in practice, in addition to theory.

Students are encouraged to participate in online communities, discussion forums, and coding groups to connect with peers, seek guidance, and share knowledge. Collaborative learning provides opportunities for code reviews, pair programming, and collaborative projects, allowing students to benefit from different perspectives, receive feedback, and learn from the experiences of others.

By solving complex exercises, projects, and coding puzzles, students improve their ability to break down complex problems into smaller, manageable parts. They will be skilled in designing effective algorithms, analyzing conflicts, and implementing effective solutions [6].

Practices are a good tool for teachers to provide an efficient and effective way of teaching. Practices, rather than theory, improve the learning of the lesson, help students improve their programming skills, and provide an opportunity to test their acquired knowledge.

Practice teaching methods are important in providing motivation and easy learning for teachers and students. For example, students can develop practical knowledge by using methods such as creating case studies for students, providing programming using tables and graphics, and performing team work in programming. This is essential in ensuring effective and best practices for teaching algorithmic languages and programming courses.

Thanks to these technologies, various methods and tools are being used to effectively organize education. Although significant work has been done in this regard, the need to carry out a lot of work in the field is still on the agenda of life.

The wide use of digital technologies in the higher education system, the improvement of the quality of education, the achievement of students and young people's education at the level of today's demands, and the implementation of the unified state policy in the education and upbringing of the future generation are bearing fruit. On the initiative of the President of the Republic of Uzbekistan, the project "1 million Uzbek programmers" was introduced together with foreign partners in order to train a generation of specialists in digital technologies. The main goal of the project is to train a generation of specialists in the field of digital technologies, to provide them with the necessary knowledge and skills in programming [7].

8. Strengthening Courses for Teachers and Programming Mentors:

Teachers and Programming Mentors ("Mentor", a person of varying age or experience who generally supports a pupil or student) to strengthen the courses - this is very important to improve the quality of teaching in the field of algorithmic languages and programming. Teachers and mentors play a major role in the preparation and delivery of courses during the teaching process. Consolidating their courses helps make learning easier and more efficient for students.

In the process of developing courses, teachers and mentors use various techniques and methods to interest students, make them love programming, and increase motivation to learn new material. This helps students to fully understand and master the course.

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Reinforce courses for teachers and mentors, allowing students to easily teach programming skills, effectively teach innovations, and keep up with the latest technology developments. Also, this process helps to provide the students of the program with advanced skills, their professional development and success in their field.

9. Improving students' mastered study directions:

The teacher should pay attention to the good mastery of the recommended methods and techniques of programming by students, and especially to the use of unique and clear terms. With this, it is possible to get rid of misunderstandings that may arise when using different languages. The world of ICT specialists has its own language, and only the correct use of terminology ensures smooth communication between people involved in the programming process. Some important terms are additionally indicated in the book with their English names. It is of great importance for communication in an international context (e.g. in tenders, English literature or searching for articles in English on the Internet), and when necessary, these terms are used by students in additional special English classes (English for professions). It is necessary to study [9].

Improving students' mastered study directions is very important in the educational process. More implementation and confidence building is needed for students in each lesson to increase the learning areas that students have mastered. For example, at the beginning of the lesson, it is important to conduct a short discussion about the students' knowledge and skills, and at the end of the lesson, it is important to hear the feedback of the students through the questions given by the teacher and ask logical questions to activate their thoughts.

There are a number of good ways to increase students' mastery of study areas. This includes using interactive components through lessons, strengthening students' knowledge and skills through hands-on activities, and encouraging students to actively participate in the learning process. Also, the modern and advanced environment in which classes are held helps to increase students' motivation. By implementing these methods, students will succeed in improving their mastered study areas.

10. Importance of results and self-study:

Results and self-study are very important in improving algorithmic languages and programming courses. As a teacher, you have to teach students theoretical information while helping them learn independently and achieve results.

By giving advice to students, answering questions and helping them to understand better, you need to create important opportunities for their learning and development. With independent teaching, teachers can work better as a unit to understand all the needs of the students and encourage their learning. As a result, students will successfully complete the course and be prepared to master the field of programming. This leads to great success for the teacher and the development of many children for the students of the course.

CONCLUSION. In this article, we considered improving the methodology of teaching algorithmic languages and programming courses, demonstrating effective practices. This guide will provide you with the best methods on how to organize the exercises in the article. We hope that this information will help you to organize a training course in algorithmic languages and programming. Follow this guide and we hope you'll see for yourself what makes students successful in learning algorithms and programs. In the article, you have familiarized yourself with the recommended practices, in which, in teaching algorithmic languages and programming courses, rather than theories, students will be able to better understand the program code by expanding their algorithmic thinking skills. In

addition, what goals should be set for the teacher to increase the effectiveness of teaching algorithmic languages and programming languages. We hope that the concepts and strategies shared here will be valuable to teachers and students. By implementing these advanced teaching methodologies, we aim to enhance the learning experience and deepen understanding of algorithmic languages and programming concepts. Thank you for learning these best practices with us and may your learning efforts be successful and rewarding.

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