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DEVELOPING PYTHON PROGRAMMING LANGUAGE SKILLS BASED ON INTERACTIVE METHODS

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Abstract
The article deals with the issues of teaching programming languages in higher education, and the author suggests paying special attention to interactive methods. The article discusses the organization of interactive education in higher education institutions, the use of game technologies, the optimal option of the model of interaction between the teacher and the student. The discussion focuses on the problems of teaching programming, for example, the use of interactive methods for each topic, and the creation of a model of a personal learning environment for the teacher and the student. The author recommends to learn Python, one of the interpreted algorithmic programming languages, for teaching programming.

Keywords: education, technology, interactive method, environment, Python, programming, language.

INTRODUCTION

Today, the development of the national innovation system and the improvement of its innovation potential are the most important factors of the country's economic growth. The demand and attention to the use of innovative technologies, pedagogical and information technologies in the course of education is increasing day by day. One of the reasons for this is that, until now, in traditional education, students were taught to acquire only ready-made knowledge, but modern technologies allow them to search for the acquired knowledge by themselves, study and analyze it independently, and even draw conclusions by themselves. teaches to cause. Active use of advanced pedagogical technologies in the educational process, improvement of educational efficiency, analysis and introduction into practice is one of the important tasks of today.

Research scientist M.I. Makhmutov describes teaching methods as follows: "Educational methods are a system of regulatory principles and rules for the organization of pedagogical purposeful interactions between pedagogues and students in the framework of certain issues of teaching, development and education" [7]. Thus, in this definition, the method includes both the rules of how to act and the methods of action themselves. Educational methods play an important role in our lives and have special attention, in the digital age we live in, we want an effective, dynamic, fast and interactive approach. The term "interactive" is found in two separate areas of research discourse in the field of education, i.e. pedagogy and new

technologies in education. In today's rapidly developing period, conducting lessons in a traditional way, especially in higher education institutions, does not give effective results as seen in students. The word interactive is the key to having an effective learning process where the teacher engages the students and the students learn more than the traditional method.

In interactive learning, the goal is not for student interaction, but for interaction to identify and fulfill individual student abilities and needs. For this, it is necessary to follow the following principles:

• principles of individualization of programs, events and methods (in which the student communicates with partners);

• the principle of interaction of everyone with everyone;

• the principle of self-management (students participate in planning, organizing, managing the educational process);

• principles of group optimization.

Thus, the methodology of using interactive technologies in computer science classes is as follows:

• increases students' motivation;

• provides interactive interaction;

• enables to activate the student's actions. (Just listening and watching is not enough, some questions asked during the shows will be answered);

• provides an opportunity to evaluate the behavior of each student, if there is a wrong answer - advice and an offer to try again;

• allows organizing collective - independent work in a group;

• allows the teacher to monitor the work and proposals of students individually, correct this work and help students.

Many methodological innovations in teaching, explaining and developing skills in the educational process are associated with the use of interactive methods of teaching, and interactive methods include joint education. The teacher often works only as an organizer of the learning process, and the group leader creates conditions for student initiative, and in addition, interactive learning is based on direct interaction of students with their own experience and the experience of their partners. [6]. The main rules for organizing interactive education in higher education institutions are as follows:

Rule I. In the course of the lesson, participants should participate in one way or another, and modern technologies should be used to involve all participants in the discussion process.

Rule II. To increase the efficiency and quality of education, it is necessary to take care of the psychological readiness of students to expand their thinking and develop their imagination. We are talking about the fact that not all students who attended the class are psychologically ready to directly join certain forms of work, and from this point of view, it is appropriate to constantly encourage them to actively participate in work, to create an opportunity for self-realization.

Rule III. In order to facilitate the use of interactive technology methods in the course of the lesson, the number of participants should directly depend on the quality of the training, and the optimal number of participants should be up to 25.

Rule IV. In order to increase the activity of the participants, the room should be prepared in such a way that it should be easy for the participants to change places to work in large and small groups.

Rule V. It is necessary to develop mechanisms for establishing a clear unification (fixation) of procedures and rules in the course of the lesson, agree on this at the beginning and try not to violate it. For example: all participants show tolerance for any point of view, respect everyone's right to freedom of speech, their dignity.

Rule VI. It is necessary to pay attention to the division of seminar participants into groups (work in pairs, small groups). It is organized according to the technology of setting a problem, forming small groups (5-7 people each), distributing roles in them, presenting, discussing the results in front of the whole study group, discussing the problem in small groups, continuing the discussion and summarizing . The advantage of this work is that the student feels the support of a friend, all students have the opportunity to talk to their partner, exchange ideas, and only then announce them to the whole group.

Interactive methods of teaching allow two-way teaching, which eliminates the passivity of students, involving more students in the process makes it more interesting. The same old lecture-style teaching is no longer interesting because it often bores students in the classroom and students lose interest in such teaching. Instead, they are choosing interactive teaching methods to create an atmosphere of attention and participation, because interactive teaching methods make the learning process interesting and fun.

After analyzing the scientific work of professors of higher education institutions, about the interaction of the educational environment at different levels, the optimal option of the model of interaction between the teacher and the student is programming science by students. was determined within the framework of the study and the composition of the model [1] was created based on this. In the educational process, PTE (Personal Teaching Environment) and PLE (Personal Learning Environment) have been improved on the basis of a number of interactive methods, which include universality, flexibility, multidimensionality, cyclicality and communication functional features [4]. It is responsible for performing the functions of teacher-student resource and communication, in addition to the functional features of the personal environment indicated above, allowing for the organization of training on a specific subject and the entire course. These functions support the creation, storage and deployment of electronic learning resources, as well as the use of resources by students and teachers, and support communication between them. Permissions for student PLE content are modeled as follows:

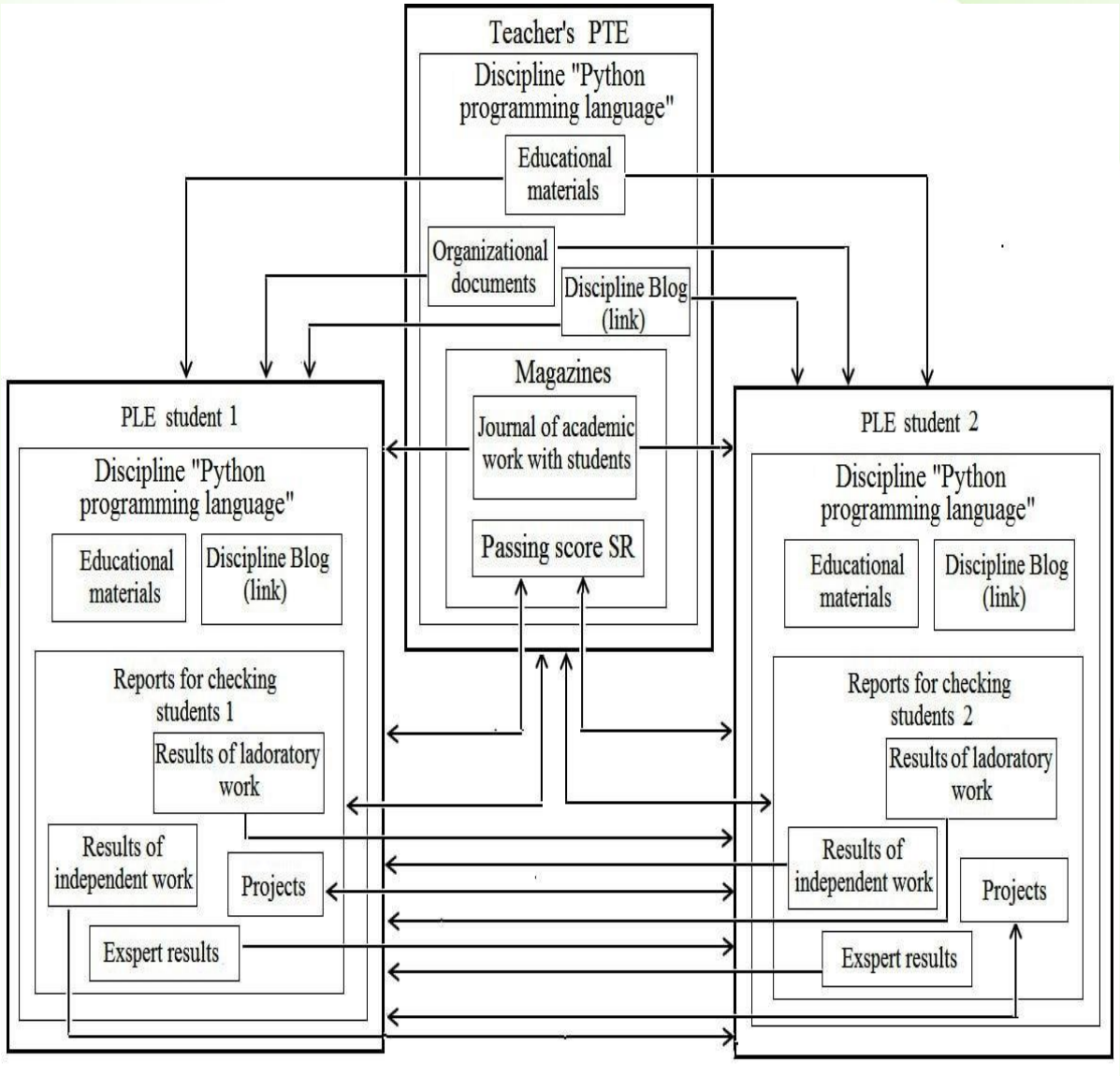

Figure 1. Interaction model between teacher PTE and student PLE

The presented model of interaction between the teacher PTE and the student PLE in the organization of programming training allows to create, store and distribute content, organize joint activities, manage the student's educational activities and the student's environment. Games used in pedagogical processes, like any games, have their specific purpose and result. Game technology is an educational technology based on simulation [3] and modeling of role-playing behavior of game participants in the process of solving problematic educational issues of a sufficiently high level. The model of educational technologies in the game creates an educational process by involving the student in the game, and the game is currently an "Exemplary" type of human activity, which includes the positions of introducing learning and cognitive activities. The game is a mechanism of preservation and later transfer of practical and moral social experience combined with certain requirements of behavior in certain situations. The reality of gaming technology lies in entertainment, which can be

transformed into learning, creativity, a model of human interaction and a role model in labor relations. The following modern game technology is used in the educational institution, which relies on the activation of the educational process and increasing its efficiency [5]:

• independent mastering of the concept, topic and section of science as technologies;
• as elements of wider technology;
• as a lesson technology or part of it;
• as a technology for extracurricular activities.

Game technology as an independent concept includes a very large group of methods of implementing the pedagogical process in the form of various pedagogical games. It is the pedagogical game that has an important difference from ordinary games, which can be characterized by a well-defined educational goal and a corresponding pedagogical result, which can be characterized by justification, definition, educational and cognitive orientation. During the lesson, the game form of lessons is created with the help of game techniques and situations, which serve as a means of stimulating educational activity [2]. At the same time, one of the important factors that increases educational efficiency is the use of game technologies at different stages of the lesson in teaching programming languages. A practical program site for improving independent teaching of programming languages based on interactive methods in higher education institutions was developed (Fig. 2). On this site, lectures on the science program for learning programming languages are posted in a row, which allows students to first get acquainted with the theoretical part of the subject, and then to strengthen their theoretical knowledge based on game technologies through practical training. Also, based on interactive methods suitable for each lecture, opportunities for effective learning of knowledge were created using test, match, brainstorming and working in small groups. This, in turn, leads to effective and high-quality mastery of knowledge and skills on the basis of game technologies in relation to software education.

Figure 2. Program for independent learning of programming languages based on interactive methods

The goal of the game technology is to develop the skills of logical and critical thinking and compromise in students and to determine their understanding of the issues of student rights. Game technology is important in the educational process, because it helps to develop the interest and activity of students, and it also performs a number of functions. For example, the use of the "Find the match" method in teaching the Python programming language stimulates students' mental activity, develops attention and interest in the subject, and is one of the ways to combat student passivity. Using this site, students will be able to get the information they need about the Python programming language and test their knowledge based on the interactive methods provided to strengthen their knowledge. If we can increase students' interest in this subject through the given game technologies, we will increase the rate of students' mastery. In conclusion, the organization of interactive education leads to simulation of life situations, general solution of issues based on the analysis of situations, penetration of the flow of information and its activity.

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