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METHODOLOGICAL REQUIREMENTS FOR THE CREATION OF AN ELECTRONIC TEACHING ENVIRONMENT (E-TEACHING)

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ABSTRACT

The article provides information about the electronic teaching environment, its algorithms. Methodological requirements for the creation of an electronic teaching environment are also illustrated. Moreover, information is provided on types of the e-teaching environment based on its purpose.

Keywords: Electronic teaching environment (e-teaching), coach-type programs, algorithms, methodological requirements and types according to the purpose.

INTRODUCTION

The radical changes taking place in our society nowadays, the practical steps towards a gradual transition to an informed society and the ongoing reforms to integrate into the global education system require the widespread introduction of modern information and communication technologies into education.

For the development of information and communication technologies Decrees of the President of the Republic of Uzbekistan "On approval of the Strategy of innovative development of the Republic of Uzbekistan in 2019-2021" No. DP-5544 of September 21, 2018, "On measures to further improve the field of information technology and communications" No. DP-5349 of June 30, 2017, "On measures to radically improve the conditions for the development of information technology in the country." No.DP-5099 of September 30, 2017.

The Action Strategy for the five priority areas of development of the Republic of Uzbekistan for 2017-2021, approved by the Decree of Mirziyoyev dated February 7, 2017, identifies the main tasks for further development of the country in all areas and building a territorial-democratic society.

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The e-teaching environment means comprehensive description of the teaching process, including the learning material, the tasks required to assimilate it, and instructions for their implementation and supervision. As a rule, the curriculum is formalized in the form of a set of relatively small sections of the study material, ending with a control question, assignment or instruction on the student's next steps.

The basis for creating the educational process using computer tools should be taken into account in the organization of programmed learning ideas related to the below theoretical rules (V.P.Bespalko, T.V.Gabay, A.I.Kuptsov, G.K.Selevko, N.F.Talizina et al.): it is necessary to take into account the possibility of algorithmization of the stidy process; on the consistency and hierarchical subordination of methods of managing the educational activities of school-children; on the gradual organization of the educational process; on presentation of educational material in small pieces; on the systemic nature of the feedback between the student and the teacher and its correction on the basis of the activities of school students.

Further, the study identifies the basic rules determining the direct organization of the study process in the computer environment based on activities, which should also take into consideration the followings: the general didactic potential of electronic technologies; on the possibilities and methods of individualization of the study process while working with computer technology, in particular, the modular basis for building an e-teaching environment for changing education; about the possibilities of using the interactive mode of the computer as a basic condition that provides supervision over the process of development of education through the electronic teaching environment (A.A.Andreev, A.I.Bashmakov, E.A.Bondarenko, T.Gergey, A.A.Jurin, I.G.Zakharova, I.A.Milyutina, K.V.Petrov, E.S.Polat, I.V.Robert and others); on the didactic requirements for the creation and use of educational computer programs (Ya.A.Vagramenko, B.S.Gershunsky, E.I.Mashbits, I.V.Robert, O.B.Tishchenko and others).

The basis for classification is usually the characteristics of the educational activities in which students work with programs. Many authors distinguish four types of curricula [2]:

- teaching and supervision;
- coaching;
- imitation and modeling;
- educational games.

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Any algorithm has input and output, and in this, the data enters the computer, the algorithm itself performs the required process and gives the result. Learning algorithms are algorithms that create algorithms based on other data.

THE MAIN FINDINGS AND RESULTS

There are several types of organization of teaching-type programs, which are also called teaching electronic environment (e-teaching) algorithms.

1. Sequential preparation algorithm is simpler than the initial element of the task, requiring the second to be more complex, and this, in turn, the third, and so on. The final elements will consist of a very high level of difficulty.

2. Parallel preparation algorithm - the initial elements of the tasks independently ensure the execution of the next complex process at a high level.

3. Sequential correction algorithm - the initial elements of the task have a high level of difficulty, and each subsequent element corrects the work of the previous one, for example, shows the contradictions that lead to incorrect answers.

4. Parallel correction algorithm - the student is offered a highly complex element, the next elements play the role of guide (motivator) to different positions independently of each other.

5. In the transmission algorithm. Two arrays of elements A [N] and B [N] will be given. They can be concepts, relationships, actions, features, and more. It is necessary to establish logical correspondence between them.

6. In the analytical algorithm. Elements A [N] are suggested. It is necessary to determine whether each of them belongs to one of the B [N] classes.

7. In synthesizing an algorithm. The elements of the array A [N] are already divided into small groups. The task of the reader is to determine the criterion by which this classification is made.

8. When ordering an algorithm. The elements of an array A [N] should be sorted according to certain B [N] criteria. This algorithm requires complex mental activity to perform it.

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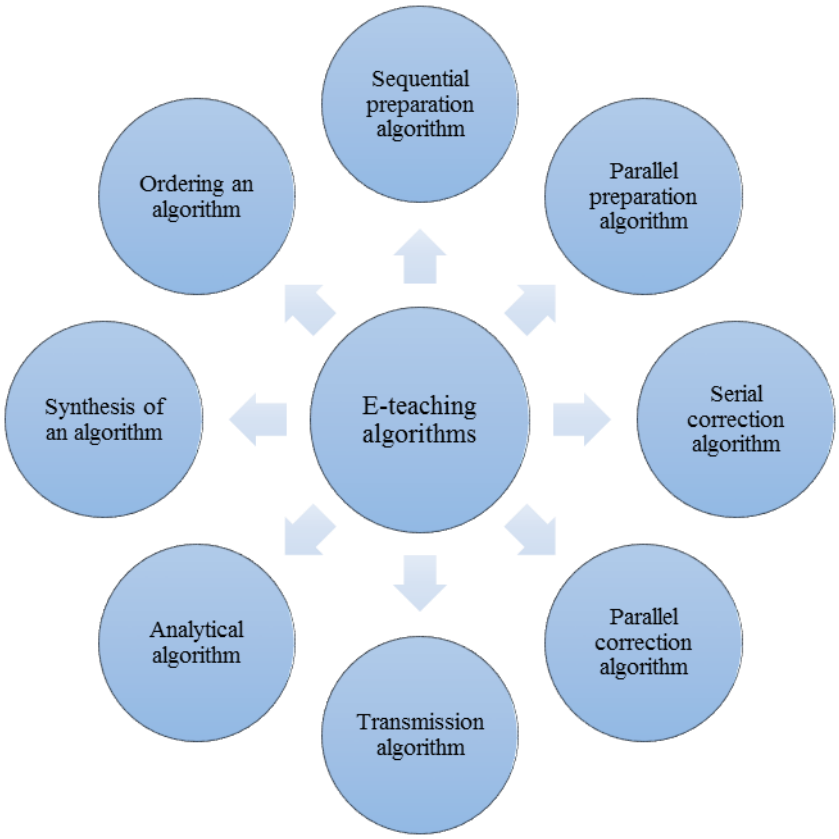

Most instrumental systems shape the teacher's ability to create study and supervision exercises with different types of responses:

1. Choice answer. The student is offered a task (question) and a set of ready answers (menu), from which the correct answer (confirmation) is chosen according to his opinion.

This version of the task is the most convenient for the machine to perform, because the computer only analyzes the number, which can easily determine the correctness of the answer. Tasks with a selected answer at a glance have a number of shortcomings, precisely: it necessarily provides the correct answer, the ability to predict it and therefore limits the mental ability of the student. Different principles should be applied in overcoming these disadvantages. Proper approach to these principles, creative and skillful approach will significantly reduce drawbacks.

The probability of guessing the correct answer is minimized using the following simple tricks:

• repeating a similar question in several different ways;

• an increase in the number of selected elements (the probability of guessing when choosing one of the five answers is 0.2);

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• Increase the number of correct answers by two or more pairs. The answers to the tasks should be chosen in a way that is convincing and equally appealing.

2. Partially projected answer. These types of tasks are the intermediate link between the selected response and the tasks. The partially structured answer consists of suggestions made by the teacher.

This rule is used to formulate definitions of laws, theorems, standard formulas, assignments, and more. As a rule, not all elements of the task are included in the correct answer and the order of their selection is not strict.

3. Free-design response. This type is most suitable for learning and managing automated tasks. They allow the listener to communicate in a natural language with the computer by simulating a dialogue between a student and a teacher. Tasks with a freely structured answer are the most difficult for the reader because they completely rule out the possibility of guessing and require significant mental work before entering the answer into a computer, which is typed freely on the keyboard. At the same time, the complexity of the teacher's work increases sharply - a course for the formation of autonomous responses for the instrumental system analyzer begins [1].

As a rule, the template can consist of more than 80 characters, including spaces. The student’s answer to the given question is compared with the standard text and an appropriate answer sign is developed, i.e. “correct”, “incorrect”, “guessed” and so on. The program then moves to the block of scripts corresponding to the received attribute.

Thus, the course author forms frames presented to the student based on the sign of the answer, creating the illusion that the system “understands” the meaning of the entered phrase because the student receives a different reaction from the computer with different answers to the same question [2].

To describe the model of the electronic teaching environment in Web programming, a list of methodological requirements for the creation and use of a computer-based electronic teaching environment (e-teaching) in Web programming is developed and based on:

1. The development and use of the e-teaching environment should be based on basic didactic principles. These include: scientific character, systemic character, conscientiousness, clarity, usability in teaching. In many ways, in this case, they retain the traditional meaning for Web programming teaching methodology, however, some of them have their own characteristics of interpreting Web programming with the problem of teaching on a computer.

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2. The content of the e-teaching environment should be based on normative methodological bases (consistent with the content and content structure of Web programming education created by the computer program). The structure of the electronic teaching environment provides the formation of theoretical and current educational knowledge about Web programming, a range of information on HTML, CSS, PHP, materials on teaching methods, teaching and development subjects, ensuring the mastery of students in their own experience of cognitive activity need. Due to the specific nature of Web knowledge, computer-assisted teaching of the Web should be based on a combination of traditional teaching methods and specific methods provided by a computer program.

3. Methods of computer-based teaching should ensure the unity of knowledge and activity components of the process of teaching science, the development of educational content based on the organization of individual cognitive activities. Methods of managing these activities of school students include the use of knowledge tasks and methods of presenting information in various forms for their implementation, as well as the implementation of step-by-step supervision over the results of students' work and correcting the process of mastering content. First of all, these are traditional methods of developmental education transferred to a computer environment. In addition, the methodological palette of teaching Web programming through e-teaching should be expanded due to techniques created on the basis of new possibilities of electronic technologies.

4. According to its technical characteristics, the e-teaching environment should be based on the use of computer interactive mode, its ability to establish relationships between a computer and a student, supervision the process of students' cognitive activity, as well as the potential of a computer as an audiovisual teaching tool.

The general methodological model of the e-teaching of web programming takes into account different ways of using computer training programs in the process of teaching web programming. Therefore, a possible classification of computer training programs on various grounds is under consideration. Thus, according to the role of the e-teaching environment in the structure of the education process can be divided into the following types:

- Monoprogram for one lesson;
- complex (modular) programs consisting of modules for transferring fragments of a whole set of classes combined with a common problem [1].

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The proposed Web programming e-teaching environment can have the following objectives in the process of teaching Web programming:

- Comprehensively implements the objectives of the formation, education and development of students' knowledge in web programming classes;
- The main purpose of the formation of students' knowledge is based on the organization of active independent activities of students to obtain, understand, systematize and evaluate educational information;
- develops skills aimed at teaching school-children the methods of educational activities;
- focuses on the realization of the educational potential of Web programming on the basis of emotional impact;
- monitoring and diagnostic programs - will be aimed at obtaining information about the achievements of students in the process of teaching Web programming and identifying problems in learning;
- Correction programs will be aimed at closing the gaps in the knowledge and skills of school students in the study of the basic course of Web programming.

The e-teaching of web programming consists of the following follow-up parts:

1. Introduction to the topic - motivating.
2. Theoretical part - information on the topic, video lesson.
3. Interactive assignments, exercises, tests.
4. Monitoring and diagnostic programs.
5. Analysis of results.

The application of the e-teaching environment is a method of group research projects that simulates real scientific community activities. This technology includes the following considerations:

• initial motivation to learn; identify any paradoxes, describe problems;
• interpretation of the paradox, construction of hypotheses;
• conducting research, experiments, observations and measurements to prove or disprove hypotheses, explanations;
• grouping of results;
• Solve the problem of practical application of project results.

The electronic environment that teaches web programming is yielding positive results in the application of non-traditional teaching methods.

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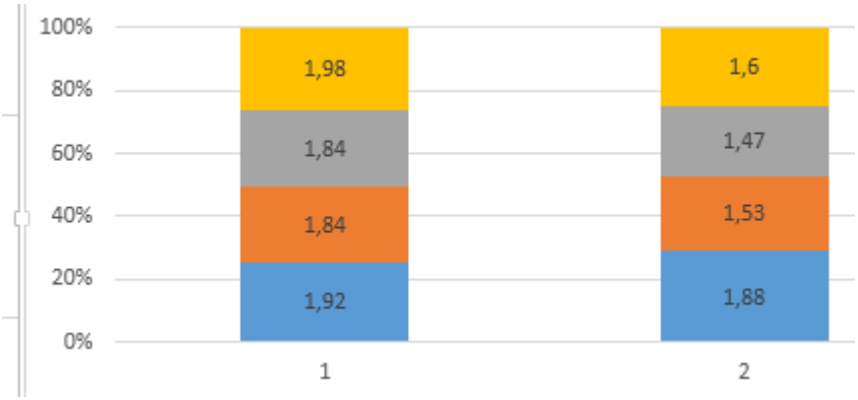
Competency level scales of the electronic environment that teaches web programming

Components competencies	Experimental group				Control group			
	Levels (%)			Average value points	Levels (%)			Average value points
	satisfactory	middle	high		satisfactory	middle	high	
Motivational part	33,14	42,12	24,74	1,92	30,06	52,26	17,68	1,88
Organizational part	29,82	56,14	14,04	1,84	53,44	39,66	6,90	1,53
Cognitive-operational part	31,30	53,44	15,27	1,84	54,20	36,64	3,82	1,47
A person-centered section	26,23	49,36	24,41	1,98	49,17	41,31	9,52	1,60



CONCLUSION

To sum up, in the upbringing of the younger generation, who are studying in the XXI century in the century of science and technology, it is necessary to provide in-depth knowledge and the rules of etiquette in the family and school. The conditions for this have been created in our country, and only the implementation of this depends on the extent to which the worldview of our youth is formed. The use of e-teaching environment in education is of significant importance in changing the outlook of the youth learning web programming.

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Users of the e-teaching environment are students and their high didactic potential is improved using resources with a clear psychological-pedagogical basis, taking into account the level of knowledge of students for independent work, many of whom are able to study independently, almost without teacher assistance. As a result, the active role of the teacher is taken by the students, and motivation becomes the main task of the teacher.

- As a result of the use of the e-teaching of web programming by the teacher in the educational process, students develop the following competencies:

- - develops methods of visualization and virtualization of the educational process;

- - changes the "teacher - student" relationship;

- - Increases the effectiveness of independent work in extracurricular activities;

- Systematically monitors the quality of learning content in the educational environment, organizes the educational process;

- shows the results of intellectual analysis of the student's answers in the organization of education;

- allows you to immediately find answers to the difficulties that arise in the performance of each task;

- Masters the technology of creating a website;

- Masters the processing of information in electronic media;

- Designs and uses Web systems;

- Creates Internet sites and places information.

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