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Abstract: The purpose of this study is to improve the quality of education through the creation of an interactive intellectual e-learning resource in the training of specialists in higher education and the widespread use of artificial intelligence in the process of informatization of education based on information and communication technologies. Research methods involve the practical analysis of practical and independent learning tasks in relation to the student's abilities, the solution of the problem by dividing it into n lower levels of problem parts and combining the parts. Research shows that the main advantage of using artificial intelligence in the e-learning process is that students can ask and answer questions about technology. As the student interacts with the course content, AI allows each student time to discuss in depth.

Keywords: e-pedagogy, e-learning, creative competence, AI, professional creativity, artificial intelligence, task differentiation, task integration.

INTRODUCTION

In the developed countries of the world, high results are being achieved through the widespread use of artificial intelligence in the process of informatization

of society on the basis of information and communication technologies. Systematic work is underway to implement large-scale projects to continuously improve the quality of education based on digital technologies. The use of interactive intellectual software, distance learning, open learning resources, the use of intellectual e-learning resources in the development of mixed education (online, / offline) technologies is a pressing issue in the process of training specialists in higher education institutions. is considered. The main advantage of using artificial intelligence in e-learning is that students can ask and answer questions about technology. Students sometimes try not to ask questions in class because they are afraid of being rejected by their peers. Therefore, with the introduction of interactive intellectual software in education, it will be possible to implement approaches to the individualization of educational activities of students based on the use of e-learning. In the process of training future engineers, the practice of improving the process and tools for assessing the quality of education through the visualization of educational services and the introduction of information and communication technologies for the teaching of technical sciences, the generalization of analytical results and conclusions.

The share of scientific research aimed at the development of methodological foundations of teaching science and natural sciences and interactive intellectual e-learning resources based on information and communication technologies, the technologicalization of the educational process is growing significantly in the world. In particular, the optimal approach to the use of interactive intellectual e-learning resources in practical and laboratory classes in an innovative e-learning environment, as well as in the organization of independent work of students in the effective organization of the training of future professionals in higher education institutions. The need to increase the scale of scientific development is obvious.

By harmonizing the education system in our country with international educational standards, ensuring the quality and competitiveness of training in higher education institutions, improving the quality level based on world experience, the widespread use of information and communication technologies to implement

scientific and innovative achievements. The development of effective methods of implementation is recognized as one of the priorities. The action strategy for the five priority areas of development of the Republic of Uzbekistan includes “construction, reconstruction, overhaul of educational institutions, their modern teaching and laboratory equipment, computer equipment and teaching aids” is listed as one of the priorities.

MATERIALS AND METHODS

The relevance of using this scientific method for our research is that the model can act as a link between theory and reality. In addition, the pre-creation of the model provides a visual representation of conceptual ideas and the resource creation process helps all participants (teachers, professionals, software developers) to understand each other.

Modeling, on the other hand, is the most important step in pedagogical design, understanding the shortest detail of what needs to happen.

The development of the interactive e-learning resource model was based on basic concepts such as the purpose of teaching and the principles of education, the approach to education.

The acquisition of knowledge, skills and competencies in algorithmic languages and programming should be aimed at achieving the objectives set out in the methodology. Teaching aids (including the e-learning resource under study in our study) All actions taken by the learner (student) to achieve the intended purpose of teaching the course "Algorithmic languages and programming" should be constructed in a way that helps.

In a knowledge-based society, the goal of education, as well as the ability to teach reading, is the general cultural, personal, and cognitive development of learners who provide basic competencies. It is this ability that allows a person to renew and improve their competencies, improve their skills, or change their type of activity through lifelong independent learning. This, in turn, depends on the ability to target

the flow of information, to select and set the desired individual educational trajectory [4].

This characteristic of a member of an informed society is revealed through the concept of a personalized learning movement. Personalized learning can be viewed in a broad and narrow sense. In a broad sense, the term refers to “the ability of an entity to develop and self-improve through education, that is, through the conscious and active assimilation of new social experiences. In the narrow sense (personal psychology) the term is a set of methods of action of the learner (as well as related to it, the acquisition of new knowledge independently, which provides the formation of skills, including the organization of this process. chase skills). The universality of the learning activities in question is the basis for organizing any student activity.

A personalized learning process is organized for each student. The basic concept of learning activities is a systemic-action approach in which knowledge, skills and competencies are viewed as the product of learners 'goal-oriented appropriate behaviors.

Acquisition of knowledge in the process of personalized learning is based on the acquisition by students of the components of learning activities (motives, goals, objectives, as well as actions and operations that must be performed with the material).

We focus on personalized learning activities that can be formed in the learner using e-learning resources.

E-Learning Resources can be used effectively to shape regulatory and cognitive personalized learning activities.

Regulatory personalized learning activities include goal setting, planning, forecasting, monitoring, correcting, evaluating, and self-correcting.

In the exercise mode, the learner is offered brief information about the specifics of the programming language and relevant assignments, as well as clarification of what goals can be achieved, in what timeframe, and by what means. When working with a resource, this information is often encountered, and the learner

acquires the ability to formulate a learning task in a variety of situations, as well as to solve it based on a plan. The proposed strategy for completing the assignments will help the learner learn to predict the results of their activities. Multiple work on the algorithm, which involves the control of program operations, a small section of steps to work with tasks, allows learners to independently control their actions, to their set goals and plans. compliance, correction when necessary, as well as evaluation of work results.

Cognitive personalized learning process, separation and formation of cognitive goals, search and separation of necessary information, selection of the most effective methods of solving problems based on specific conditions, reflection of methods and conditions of actions, monitoring and evaluation of process and results, problem solving and personalization involves personalized learning actions that involve the independent creation of activity algorithms in problem solving [5].

By working with e-learning resources, learners also learn the above personalized learning activities. For example, a reading resource can help you find and sort information that is relevant to the purpose of the study, as well as select the most effective ways to solve problems, depending on the circumstances. It is clear that the training in question is the result of training using electronic means. The ability to create algorithms to solve creative problems arises after learners have mastered a set of algorithms selected according to the types of sample tasks [1].

Individual (self-determination, acquisition of ethical goals) and communicative personalized learning activities (ability to plan learning collaborations, ask questions, resolve conflicts, express their opinions) with the formation of, independent work (using the resource) is carried out in collaboration with the teacher and the learner at the expense of time saved at the expense of increasing the share [2].

In the process of learning programming language commands, the educational impact of an e-learning resource is realized through the following: Content of teaching materials: Encouraging learners' independence. To do this, the materials included in

the e-learning resource are selected in such a way as to teach the learner not only the most optimal work strategies and tactics for working with tasks, but also provide information about the specifics of each command. When working with resource assignments, the learner becomes familiar with the specific features, i.e. the rules, of the behaviors performed by the computer.

E-learning is an effective tool to encourage learners to work independently, as it not only provides them with the materials they need, but also helps them learn how to work interactively. The e-learning resource is designed to help identify the common mistakes made by each learner and to master the most optimal and effective ways to perform the types of tasks that these mistakes are made [3].

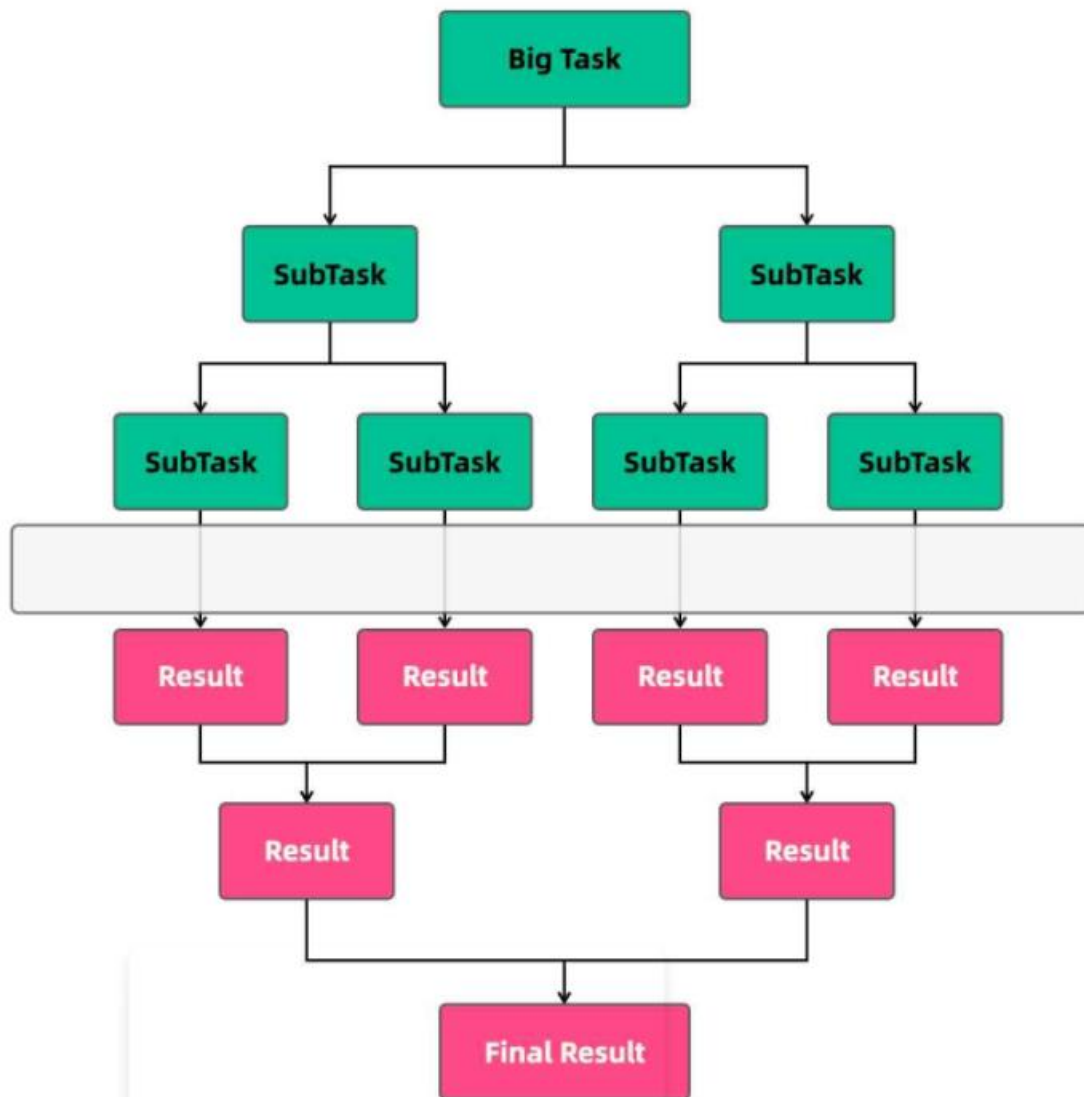


Figure 1. The process of dividing the task into parts and collecting the results.

The task is divided into n parts, depending on the student's ability to perform, and the completed parts are collected. The principles of teaching are the basic rules that together determine the requirements for the learning process and its components, namely, goals, objectives, methods, tools, organizational forms, the teaching process. The development of e-learning resource model as a new generation of educational tools is based on the basic didactic, psychological and individual methodological principles of teaching, as well as the principles of e-pedagogy [1].

In addition, science-based learning materials that contain interesting and up-to-date information included in the e-learning resource support student motivation. The ability of the resource to update and correct training materials quickly and without significant material costs ensures that the assignment materials offered to the learner are always up to date. the electronic form of the resource, its design, the availability of multimedia information, the conformity of modern man to the ideas of modern science and technology, its use at any convenient time and place, as well as saving on the purchase of printed educational materials.

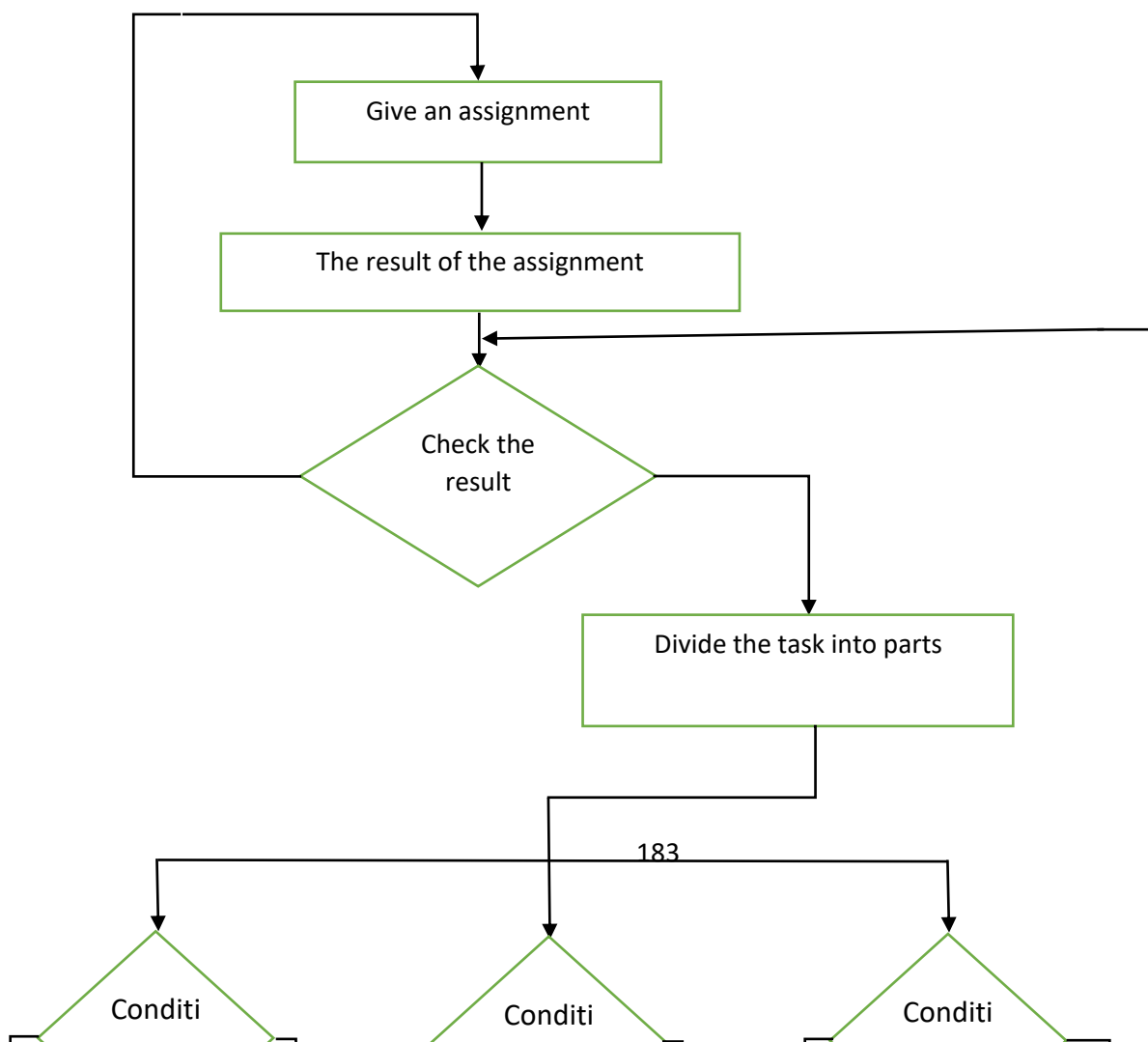


Figure 2. Algorithm for summarizing the results by dividing the tasks into parts.

The principle of taking into account the individual-psychological characteristics of the learner is implemented in the e-learning resource as follows: the program is organized in a non-linear form, the set and content of assignments, reference information, limit varies depending on the success and speed of implementation of the advice given to the recipient.

RESULTS AND DISCUSSION

In order to determine the effectiveness of the results obtained in the experimental work, the results obtained in the control groups in higher education institutions in the assessment of professional knowledge and skills of students were compared with each other. While the training process in the control groups was based on the existing traditional training, in the experimental groups, the e-learning we offered was based on distance learning using the resource. The results obtained by the control and experimental groups at the beginning and end of the experiment were systematically analyzed and compared and summarized. The effectiveness of the use of e-learning resources in the experimental group was theoretically and practically proven.

We have observed an increase in the effectiveness of teaching in teaching as a result of the organization of the teaching process in the general subject "Algorithmic languages and programming" on the basis of e-learning resources. The purpose of the pedagogical experiments was to prove the validity of our hypothesis.

In order to conduct the experiments and ensure the objectivity of the results, two parallel groups were gradually established in each academic year as experimental and control groups. In the control groups, the learning process was carried out according to the current teaching methodology, while in the experimental groups, the teaching process was based on modeling programs for teaching the general subject "Algorithmic languages".

The results of the experimental groups were regularly analyzed and compared with each other and conclusions were drawn. If necessary, feedback from teachers directly involved in the process was discussed in detail.

№	Number of students	The students who completed the task at the first step	As a result of task fragmentation	Performed using the instruction	Students who were unable to complete the task at all
1	28	5	18	4	1
2	27	7	15	3	2
3	29	6	19	4	0
4	28	9	12	6	1
5	26	6	17	3	0
6	27	3	20	3	1
7	17	8	6	1	2
8	16	2	8	5	1
	198	46	115	29	8
		23,2 %	58 %	14,6	4,2 %

Table 1. Student Performance Indicators.

It is a bit difficult for students to understand the assignments in the first step. A total of 198 first-year students participated in the experiment. As shown in the table, the total number of students who completed the first step is 46, or 23.2%. This means that students can master a maximum of 30% of a student in a traditional course. Through independent study, we can increase this figure. It is not possible to

work with each student individually. The solution to this problem is to increase coverage through e-learning resources. As a result of the division of the task, 115 students were able to complete the task. Then the number of students who completed the assignment reached 161. This is 81.2%.

CONCLUSION

This interactive e-learning resource is based on artificial intelligence and does not move on to the next task until the student has learned it. Reduces the level of the task and divides it into sections. Allows you to run a parallel section while maintaining the result of each section. Once the results of the parallel sections are obtained, the whole task is resubmitted and the result is obtained. This process can be time consuming, but automatically n students can work in parallel. Therefore, time and efficiency are high. During the course, the student may not be able to ask questions in the classroom, but may ask and learn from the e-learning resource over and over again. An analysis of the literature on the problem has shown that the formation of creativity in a person is one of the tasks of education. Therefore, the development of professional creativity in the independent study of students of higher education institutions is an urgent problem. When using an interactive intellectual e-learning resource, the student's range of independent thinking changes dramatically. When artificial intelligence is used in education, it is a virtual teacher where students work together to achieve the best results. Adapting education to the needs of the individual student has been a priority for teachers for years, but AI allows for the management and differentiation of 20-30 students in each group.

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