

## MODEL OF CREATING INTERACTIVE INTELLECTUAL ELECTRONIC EDUCATION RESOURCES

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### ABSTRACT

*Currently, the goal of higher education is to train staff using modern pedagogical and information technologies. The aim of this study is to widely apply artificial intelligence to the informatization processes of education based on the web and information technologies in the creation of an interactive intellectual e-learning resource. Research methods consist of expressing the essence of the problem posed to the student by dividing the practical training and independent study tasks into lower-level pieces according to the level of difficulty. The results of the study have a convenient and effective impact on the independent learning of students as a result of the introduction of artificial intelligence in the process of creating an e-learning resource.*

**KEYWORDS:** *Electronic Education, E-Learning, Interactive, Intellectual, AI, Artificial Intelligence, Task Fragmentation, Task Aggregation.*

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### INTRODUCTION

It is achieving high results through the introduction of e-learning in the developed universities of the world. Artificial intelligence requires advanced infrastructure and evolving innovators. The use of artificial intelligence in the creation of e-learning resources has a convenient and effective impact on students' independent learning. Artificial intelligence in education is a rapidly evolving technological field capable of changing all aspects of our social relationships. In the field of education, teaching and learning solutions based on artificial intelligence are being developed and are now being tested in various contexts. Artificial intelligence should be a priority to address digital and social disparities as quickly as possible. Systematic work is underway to implement large-scale projects to continuously improve the quality of education on the basis of digital technologies [1].

The main advantage of using artificial intelligence in the e-learning process is that students can ask and answer questions about technology. Students sometimes try not to ask questions in the audience because they are afraid to deny what their peers are saying. 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, a special place is given to the practice of improving the process and tools for assessing the quality of education through the visualization

of educational services and the application of information and communication technologies, the generalization and summarization of analytical results.

For a machine to be a teacher, artificial intelligence must be more advanced than other intelligent tasks. Advanced technologies allow us to prepare quality e-learning materials. The amount of resources required to produce quality e-learning materials is so large that we still lack high-quality e-learning materials. Based on the issue of this further improved educational software and the review and analysis of available e-learning materials, most of them are programmed learning resources [2].

## **Research Methodology**

The relevance of this method is that the model can participate in the role of 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 is the most important stage of pedagogical design, in which the activity of understanding the shortest detail about what needs to be done is understood.

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) should be designed in such a way that all the actions taken by the learner (student) help to achieve the intended purpose of teaching the course "Algorithmic Languages and Programming".

The development of the interactive intellectual e-learning resource model was based on basic concepts such as the purpose of teaching and the principles of education, the approach to education [3].

In the process of learning programming language commands, the educational effect 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 [4].

E-learning resource 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 to master the necessary methods of work in an interactive mode. The e-learning resource is designed to help identify the typical mistakes made by each learner and to master the most optimal and effective ways to perform the types of tasks that these mistakes are allowed [5].

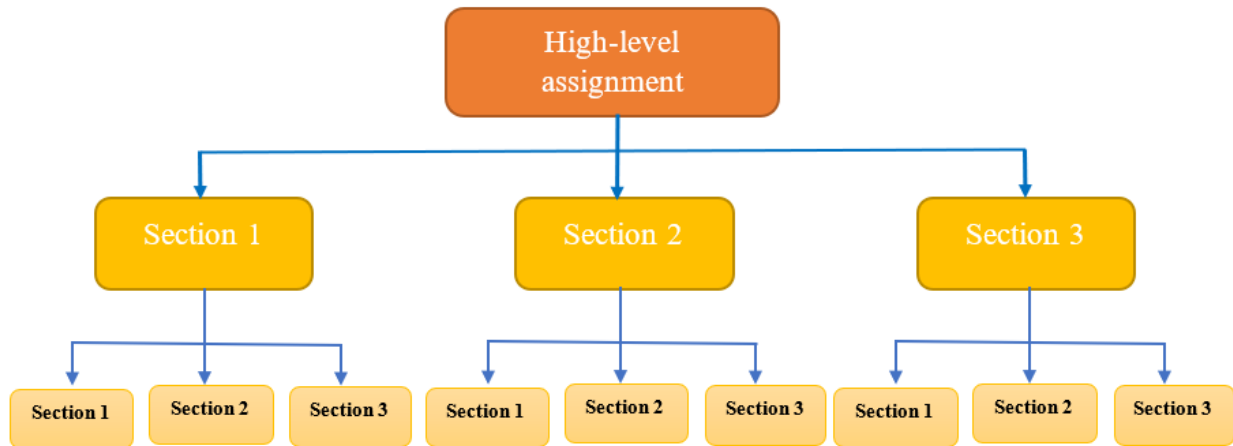


Figure 1. The process of breaking the task into pieces.

Figure 1 above shows a model of the step-by-step process of assigning tasks to a student. The task is divided into n parts, depending on the ability of the learner. Principles of teaching are the basic rules that together determine the requirements for the learning process and its components, ie goals, objectives, methods, tools, organizational forms, the teaching process.

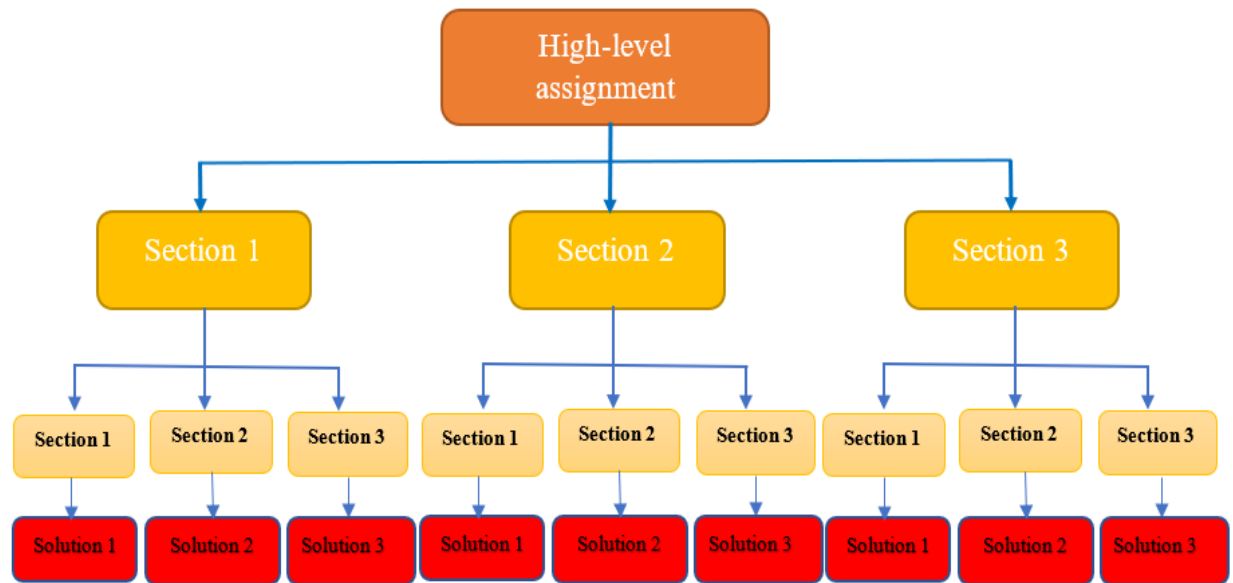


Figure 2. Divides the task into parts and finally presents the solution.

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]. The solution also helps the student understand the essence of the content of the next task or the piece in the top step.

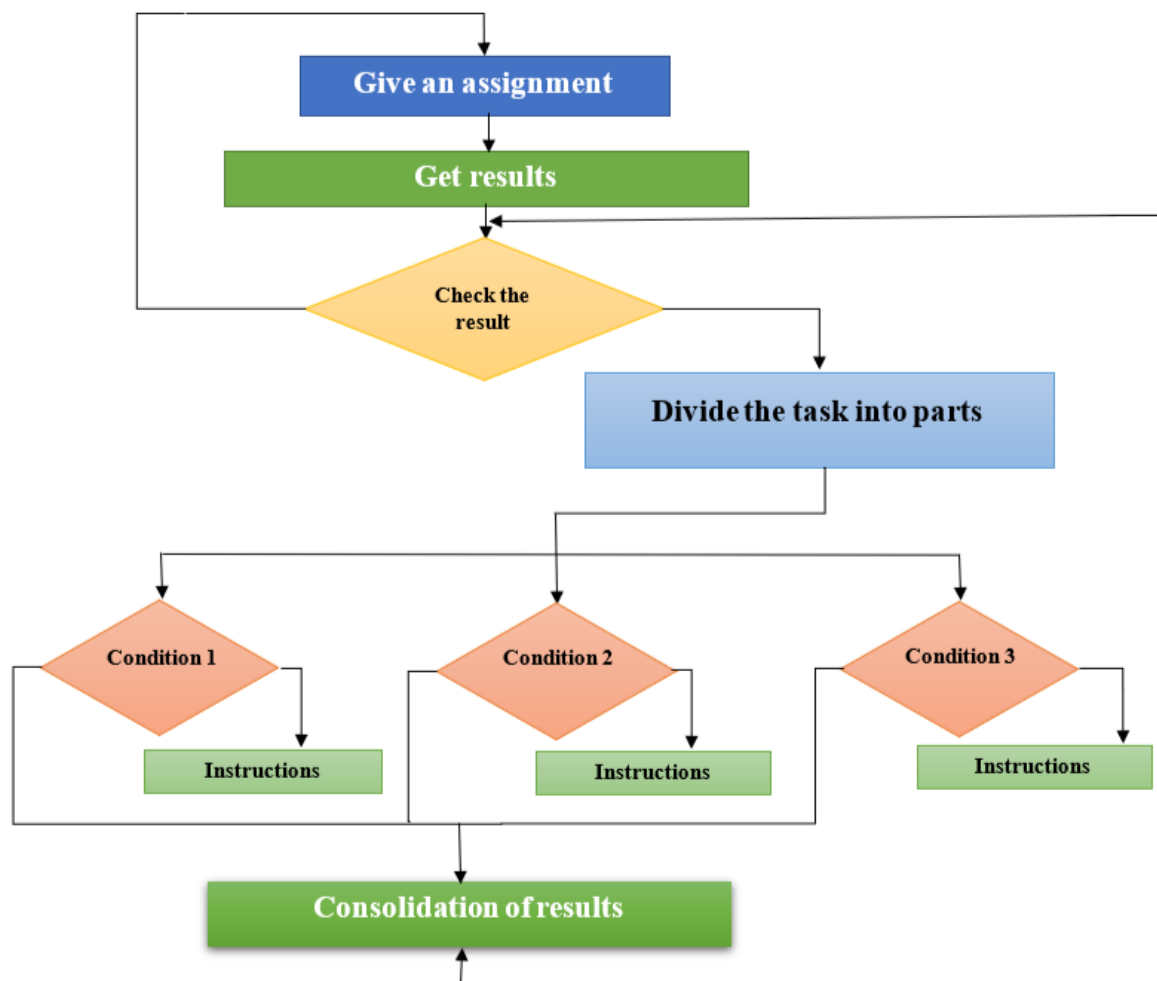


Figure 3. Algorithm for summarizing the result by dividing the tasks into parts.

In addition, science-based learning materials that contain interesting and up-to-date information included in the e-learning resource support learner 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. electronic form of the resource, its design, availability of multimedia information, compliance with the perceptions of modern man about the achievements of development science and technology, use at any convenient time and place, as well as saving on the purchase of printed educational materials.

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, depending on the set and content of assignments, reference information, the success and speed of implementation of counseling.

## RESULTS

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. In the control groups, the training process was based on the existing traditional training, while in the experimental groups, the e-learning we offered was based on distance learning using the resource.

We observed an increase in the effectiveness of teaching in teaching as a result of the organization of the teaching process in the compulsory subject "Algorithmic languages and programming" on the basis of e-learning resources.

The purpose of the pedagogical experiments was to prove the accuracy of our hypothesis put forward in our scientific research.

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

№	Number of students	Students who completed the first step	As a result of splitting the task	Those who did it using instructions	They could not 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
	100%	23,2 %	58 %	14,6	4,2 %

**TABLE 1. INDICATORS OF STUDENT PERFORMANCE**

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 our 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 will be able to increase this figure. It will not be possible to deal with each student individually. The solution to these problems will be 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%.

**DISCUSSION**

This interactive intellectual e-learning resource is based on artificial intelligence and does not move on to the next task until the student has learned. It lowers the task level and provides the pieces by dividing them into pieces. Allows you to run a parallel piece while maintaining its result when each piece is processed. Once the results of the parallel pieces are obtained, the integrated task is re-submitted and the result is obtained. This process can be time consuming, but can automatically run n students in parallel. Therefore, time and efficiency will be higher.

During the course, the student may not be able to ask questions in the classroom, but may ask and learn over and over again from the e-learning resource. 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 learning 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 applied to 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 of 20-30 students in each group and provides a level of differentiation.

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