

INNOVATIVE APPROACH TO MATHEMATICAL MODELING OF THE EDUCATIONAL PROCESS

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Annotation: The learning process is perceived in the form of an optimal management object and an innovative approach to the optimal management of the process. The functional structure of the tutorial system "teacher-reader" is given, and on this basis the cyclical structure of calculation experience is created. Keywords: mathematical modeling, optimal control, didactic system, learning process, control object, program control, computational experiment, structure of functioning, functional structure.

Problems of management of didactic systems and methods of mathematical modeling of the educational process have been studied in numerous works by L.P. Leontiev, O.G. Gokhman, R.V. Mayer, N.F. Talyzin, and others [1-3]. The solution of applied problems of management (program and optimal) for the study of the educational process begins with the creation of a functional structure for the management of the processes being studied. In this case, methods of simulation modeling are used with the application of the principle of the system approach of control theory.

This work is devoted to theoretical research from the position of the system approach of the educational process with the creation of a structure of the sequence of actions. A functional structure of the educational process is created as a didactic system "teacher-student". The structure of functioning is created by theoretical justification and a mathematical model of functioning is proposed for the purpose of optimal control and analysis of the states of the system as a whole.

Since the object under study is an open control system, the practical application of the developed models in non-deterministic objects is relevant from both theoretical and applied perspectives.

In mathematical modeling of the learning process, its specific implementation is described in the form of a correspondence between the elements of a set possible "meanings" and elements of the ordered set of "moments in time", i.e. in the form of a display Using these concepts, a mathematical model of the system is



constructed. The state of the system as some (internal) characteristic of the system, the value of which at the current moment in time determines the current value of the output value. The state can be considered as a kind of storage of information (knowledge) necessary for predicting the influence of the present on the future.

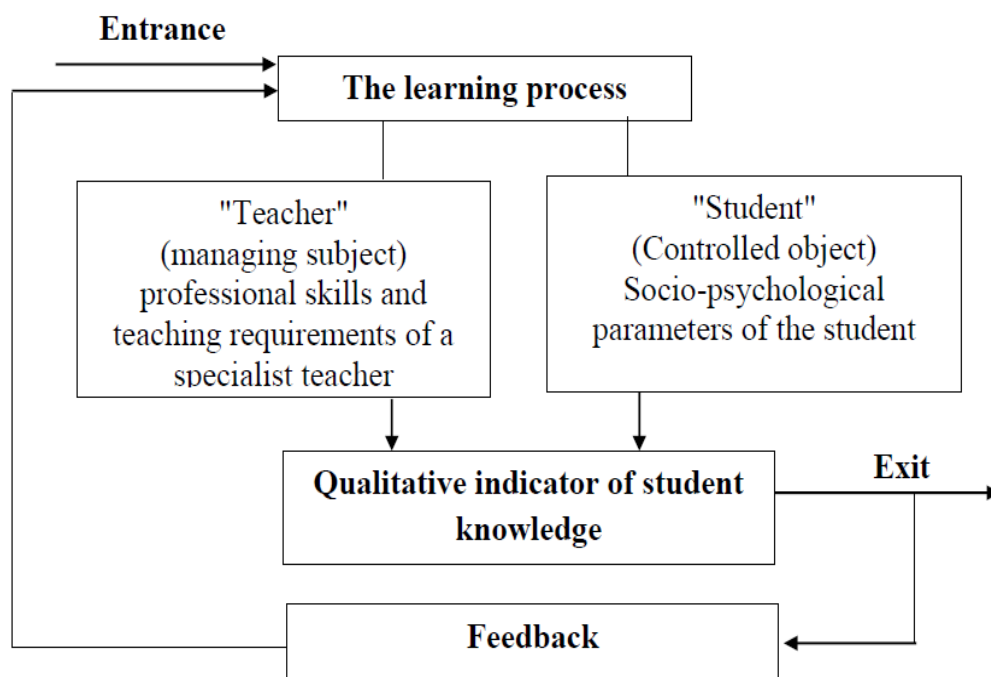


Fig. 1. Functional structure of the learning process

This means that such a mapping exists что .

In the study of the learning process, as a cybernetic research system (theoretically), the problems of developing a mathematical model of the control object, identifying special values of feedback in the system, emphasizing optimal control and synthesis of systems, transmission and processing of information and its quantitative description, development of a computational experiment using a computer are solved.

The use of these solutions in practice will improve the quality of education and preserve the knowledge of graduates of educational institutions in the long term with a minimum workload for the teaching staff. The proposed model of optimal control can be used to solve applied problems of analysis, management and regulation of the educational process.



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