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# METHODOLOGICAL FOUNDATIONS FOR IMPROVING THE MANAGEMENT OF HIGHER EDUCATION INSTITUTIONS IN THE CONTEXT OF INFORMATIZED EDUCATION

Buriyev Kholiddin Ja'farovich
Teacher of Termez State University
Email: kholiddinb@gmail.com

**Abstract**
The article analyzes the methodological foundations for improving the management of higher education institutions in the context of informatized education. Based on a review of scientific literature and existing theoretical approaches, the content of educational process modeling, the use of information and communication services, and their effectiveness are examined. The study substantiates the significance of the open structure of the pedagogical system, its interaction with the external environment, as well as the opportunities for interactivity, visualization, and the development of cognitive and creative skills in the educational process. Special attention is given to the role of information services as a methodological basis for enhancing the quality of education, strengthening students' intellectual potential, and preparing competitive specialists in modern educational systems.

**Keywords:** Informatized education, higher education institution, management, modeling, methodological foundations, information and communication services, pedagogical system, quality of education, innovative approach.

## Introduction

The role of information and communication technologies (ICT) in modernizing management processes in higher education institutions is invaluable. The Resolution of the President of the Republic of Uzbekistan No. PQ-4851 of October 6, 2020, "On measures to further improve the education system in the field of information technologies, develop scientific research, and integrate them with the IT industry[1]", emphasizes that informatized education serves not only to organize the educational process effectively but also to shape modern methodological foundations of management.

At present, the use of ICT in the higher education system is aimed at fulfilling the following priority tasks: organizing the pedagogical process, creating electronic timetables, modeling the educational process, planning scientific and methodological activities, conducting research, ensuring the quality of education and the formation of students' competencies, complying with state educational standards, creating a unified open information environment, forecasting the educational process, and organizing

[1] Qonun hujjatlari ma'lumotlari milliy bazasi, 07.10.2020-y., 07/20/4851/1352-son; Qonunchilik ma'lumotlari milliy bazasi, 15.04.2022-y., 06/22/106/0314-son, 12.05.2022-y., 07/22/241/0408-son)



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management effectively. In addition, information systems enable the creation of a centralized database, the integration of management and pedagogical data, the provision of a unified interface for users, and the development of opportunities for personalized services. As a result, all stakeholders gain equal access to ICT, while information exchange becomes automated. Consequently, it becomes possible to identify educational quality indicators, eliminate knowledge gaps based on monitoring results, and save time and resources.

From this perspective, information and communication services serve as a methodological foundation for improving the management of the higher education system. In this process, the principles of security, standardization, reliability, and scalability are defined as the main directions. The use of ICT services in higher education institutions creates broad opportunities for collecting, storing, analyzing, comparing, and making informed decisions based on systematized data. At the same time, it expands the possibility of accessing and processing large volumes of diverse information within a short period.

**Review and Methodology**

The primary goal of the educational model of the Republic of Uzbekistan is to train intellectually developed, well-rounded individuals and highly qualified, competitive specialists. Therefore, the theoretical and methodological foundations of effectively organizing management and pedagogical activities in the educational process have been extensively highlighted in various research studies. In particular, the management models of educational institutions in our country have been examined as objects of scientific inquiry by R.X. Juraev [1], R.Sh. Ahlidinov [2], U.I. Inoyatov [3], and H.F. Rashidov [4].

In the field of educational system modeling, the approaches of several foreign scholars also hold significant importance. For instance, N.Yu. Rotmistrov, T. Santalaynen[7], E. Vodtilaynen, and P. Perenne [5] emphasize such characteristics as visualization, reliability, and heuristic value in modeling the educational process. S.A. Beshenkov and E.A. Rakitina [8] define modeling as a process of systematically structuring the studied object and purposefully modifying it. Meanwhile, L.M. Friedman characterizes a model as a tool that makes it possible to draw scientific conclusions about a certain object based on another object or system.

Among methodological approaches, A.M. Novikov and D.A. Novikov have substantiated the requirements for modeling, which include the following:



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**Figure 1. Theories of Methodological Approaches**

M.D. Roblier [118] studied modeling and formalization; V.I. Pugach [explored the theoretical foundations of pedagogical modeling; V.M. Kagan and I.A. Sychenkov investigated the modeling of pedagogical systems and processes; O.S. Vikhanskiy and A.I. Naumov examined innovative approaches to modeling the educational process; M.V. Yadrovskaya [10] analyzed the essence of modeling in cognitive education; while V.A. Yasvin focused on the transition from designing educational systems to modeling them.

From this perspective, modeling is widely applied in pedagogy as one of the methods of scientific cognition and comprehension. In particular, the use of information services in higher education institutions expands the possibilities of modeling the educational process. Research shows that the implementation of information services fulfills the following methodological tasks:

Enhancing the effectiveness of learning through the visualization of educational information (by means of graphs, diagrams, animations, multimedia, sound, and modeling elements)

Strengthening students' motivation for learning, ensuring the opportunity to study at an individual pace, and guaranteeing learning outcomes.

Developing attention, perception, logical thinking, as well as cognitive and creative skills among participants of the pedagogical process

Expanding opportunities for modeling the educational process, conducting experimental research, and analyzing learning, cognitive, and professional activities

Eliminating gaps in education by assessing the results of teachers' and students' activities and providing necessary methodological support.

Based on the theories of pedagogical systems, it can be stated that the main component of any system is its **goal**. To achieve it, appropriate tools and methods are required, while changes in the system's functioning are often shaped by internal contradictions.



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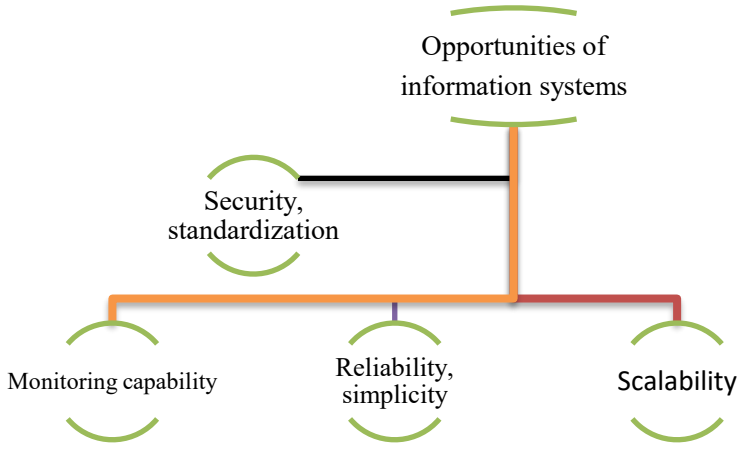
The openness of the system, in turn, necessitates active interaction with the external environment, where the flow of information determines the system's interrelation with its surroundings . In higher education institutions, modeling information and communication services makes it possible to conceptualize education as an integral system and to define its most optimal parameters. This process creates a methodological foundation for meeting the needs of the subjects of the pedagogical process, training highly qualified specialists, and improving the quality indicators of education.

## Discussion

The application of information and communication services in higher education institutions provides a number of innovative opportunities within the management system. First of all, the planning and administration of the educational process through automated systems ensure greater efficiency and prompt execution.

Mechanisms such as electronic gradebooks, attendance monitoring, and recording of students' academic ratings contribute to the transparency of the educational process. The planning of scientific and methodological activities, the modeling of research, and the use of virtual laboratories significantly enhance the effectiveness of both pedagogical and scientific work. At the same time, the use of electronic systems in line with state educational standards for assessing students' knowledge helps to achieve higher learning outcomes. It should be noted that the creation of a unified open information environment is of crucial importance for all participants in the education system.

This process not only automates information exchange but also creates conditions for systematic and continuous monitoring of educational quality. As a result, gaps in students' knowledge are identified, their underlying causes are studied, and appropriate measures for their elimination are developed. Moreover, a centralized common database plays a key role in the management of the educational process. The integration of information at various levels supports the effective adoption of managerial decisions. Providing individual and group services based on users' authority ensures a differentiated approach in educational management.




**2-figure. Specific features of the information system**



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As shown in Figure 2, the development of information systems today on the basis of these principles of opportunities ensures the stability and long-term sustainability of management processes.

The application of ICT services in higher education institutions is taking the educational process to a new stage by enhancing management efficiency, expanding the possibilities for quality control, monitoring, and forecasting in education.

## Conclusion

The analysis of the literature and methodological approaches demonstrates that the effectiveness of improving the management of higher education institutions in the context of informatized education primarily depends on the scientifically grounded application of modeling theories and information and communication services.

Modeling enables the pedagogical system to maintain an open structure, ensures its interconnectedness with the external environment, and provides harmony between goals, content, and outcomes. At the same time, information services contribute to the visualization and interactivity of the educational process, enhance students' motivation, foster the development of cognitive and creative abilities, and guarantee learning outcomes. Therefore, management models in higher education based on information and communication services are of crucial importance not only for improving the quality of education but also as a modern methodological foundation that ensures intellectual and personal development.

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