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DESIGNING A MANAGEMENT SYSTEM FOR THE DEVELOPMENT OF HIGHER EDUCATION BASED ON AN INFORMATION-COGNITIVE APPROACH

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A B S T R A C T

This article examines the theoretical and methodological foundations for designing a management system for the development of higher education based on an information-cognitive approach. The study substantiates the systemic, cyclical, and integrative nature of management, emphasizing quality, information, and cognitive management as key components. The proposed model enables effective decision-making, reduces uncertainty, and ensures continuous improvement of higher education quality through the integration of information flows and cognitive analysis.

K E Y W O R D S

Higher education development; information-cognitive approach; education management; quality management; cognitive management; information management; management system design.

INTRODUCTION

The task of designing a management system for the development of higher education based on an information-cognitive approach undoubtedly requires a theoretical substantiation of the design process and the identification of its specific features in relation to pedagogical objects.

The concept of design is closely related to modeling and, according to A.N. Dakhin, forms their interconnection. The results of pedagogical design may certainly include the structure of a management system for the development of higher education as a specific element of the education management system. However, in our opinion, the types of probabilistic models highlighted in the theory of pedagogical design represent qualitative characteristics unified into a single model from the standpoint of designing a management system for the development of higher education based on an information-cognitive approach.

The conceptual nature of the designed author's system is based on informational and cognitive characteristics, as well as on the existing regularities of higher education (structures, educational processes, and situations). Its instrumental character is based on the application of mechanisms for managing the development of higher education in management practice, relying on the Shewhart–Deming management cycle. Its predictive nature is realized through the strategic directions and goals of higher education development, as well as through the mission and vision of each educational institution. Interaction and reflection are associated with the cyclical nature of management, the need

to monitor and adjust the results of educational activities in order to continuously improve the quality of higher education as a leading factor of its development.

The constructive stage of designing a management system for the development of higher education consists in determining its optimal structure capable of ensuring:

a) solving the tasks set before the system;

b) preserving the system's characteristics;

c) technologization during the implementation of the project in education management practice.

Thus, the configuration of the designed system should ensure compliance with hierarchy, a logical representation of relationships between system elements, the connections between elements, and their functions in solving tasks that ensure effective functioning.

The design of a management system for the development of higher education is based on the highlighted principle of systemicity and the integrative representation of the characteristics of pedagogical systems generalized by A.R. Kamaleyeva: final goal, unity, interconnection, modularity, hierarchy, development, decentralization, and uncertainty.

Along with these characteristics, it is important to understand that any management system of an object can be generalized as an organized interaction through the establishment of relationships between controlling and controlled subsystems.

This scheme clearly demonstrates the cyclicality and informational content of management, emphasizing the adequacy of management as the correspondence between the level of complexity of the management system and the management object. In managing the development of higher education, multiple and internal systemicity emerges, consisting in organizing the management of a complex, weakly structured, dynamic, and active system, its subsystems, and their elements.

The complexity of the designed management system for the development of higher education is also natural, as it represents a set of subsystems, elements, and several cyclical organizational-pedagogical communications forming a complex multidimensional modular structure. Maintaining balance between the controlling and controlled subsystems is essential: the controlling subsystem is significantly smaller in scale and volume than the controlled one, both in terms of scale and number of elements, while its significance is higher and determined by the system-forming factor—quality of higher education.

The elements of the controlling subsystem include: target guidelines; management structures endowed with specific supervisory powers; control mechanisms and types; management information channels and a set of links with the controlled subsystem; methods and technologies for managing the development of higher education.

The purpose of the controlled subsystem is to manage the development of higher education based on improving the quality of education.

The mechanism for managing the development of higher education represents a method of management activity based on identifying factors, criteria, optimal conditions, and technologies that contribute to achieving established development goals. Its objectives include: determining the state of the controlled subsystem; analyzing permissible variability in the processes of educational activity; identifying the development potential of the controlled subsystem and ways of its realization; initiating changes aimed at development based on optimal management decisions.

The following features of managing the development of higher education should be emphasized: the conscious activity of all educational agents as a condition for development; a high level of uncertainty

caused by the complexity and instability of internal and external relations; organizational and social orientation determined by the nature of the controlled subsystem; cyclicality limited by the considered chronotope.

Thus, the mechanism for managing the development of higher education, acting as a means of implementing the information-cognitive approach, ensures support for management decision-making and control over their implementation, determining the ability of the controlled subsystem (higher education) to make independent decisions when influenced by its own resources.

To determine the necessary and sufficient types and methods of management, the author relies on D.A. Novikov's proposition regarding the presence of composition, structure, and management functions in any system. He distinguishes institutional management, management of composition and structure, motivational management, and information management. Within this study, considering education quality as a leading development factor and the methodology of the information-cognitive approach, it is proposed to distinguish the following interrelated types of management: quality management, information management, and cognitive management.

Higher education quality management involves influencing all educational objects and processes by the management subject to shape, ensure, and develop quality. According to A.I. Subetto, quality management functions cover three levels of management strategy: strategy development; strategy implementation through quality regulation; and organization of interaction via monitoring of education quality.

Information management remains the least studied aspect in formal education management models. Its main tasks include generating optimally structured information for management purposes, planning and controlling information flows, and monitoring higher education systems. Cognitive management, as an important addition, is based on problem-oriented knowledge necessary for identifying and solving social organizational problems, reducing uncertainty and the risk of ineffective decisions.

The information-cognitive approach to managing the development of higher education has several advantages. It enables high-precision identification of risks and opportunities through cognitive analysis of information resources and supports informed management decision-making based on explicit and tacit knowledge.

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