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Lb. CHERNOVA, L. CHERNOVA

COGNITIVE MODELING OF KNOWLEDGE MANAGEMENT MECHANISMS IN THE TRAINING OF SPECIALISTS

The **subject** of research in this article is knowledge management in the training of specialists in project-oriented organizations, in particular, higher education institutions. The **purpose** of the work is to develop a cognitive model of knowledge management for the formation of educational programs in the training system. **Objectives** of the study: to consider the concepts and mechanisms of knowledge management of organizations; to form a cognitive model of the knowledge management mechanism; to consider system indicators of cognitive model; to analyze the structural features of the cognitive model. The following **methods** are used in the work: project management methodology (knowledge management areas), system approach, cognitive and graph models. **Results**. The article provides a definition of "knowledge management", discusses the conditions under which the necessary knowledge and information will be available to perform tasks. The issue of consideration the specifics and features of the educational institution is discussed. Knowledge management methods are used in the construction of the educational process at the university. The main functions in the practical activities of the organization are given: mediation, export, internalization, cognition. Forms of practical implementation of knowledge management are also considered: educational organization, knowledge library and strategic awareness. The article also considers the possibility of the main provisions of the theory of knowledge management in the educational process, as improving the quality of training is the goal of any educational system. The article develops a cognitive model of the knowledge management mechanism, on the basis of cognitive analysis revealed useful patterns that reflect the influence of factors of different physical nature on the results of training. **Conclusions**. Cognitive modeling can be the key to rapidly improving the effectiveness of knowledge management in training. The classical approach to knowledge management requires a high level of employee involvement in relevant processes, as they need to identify knowledge, share it, record it and apply it. Cognitive modeling can reduce this requirement as it streamlines the processes of identifying, capturing, storing, and sharing knowledge. In addition, they increase the applicability of knowledge by offering appropriate context for the student. The accumulated experience of cognitive modeling of complex organizational management systems allows on a fundamental basis to approach the study of knowledge management mechanisms in the training of specialists. It is proposed to use the obtained results to configure knowledge management mechanisms in order to improve the quality of training.

Keywords: knowledge management; cognitive technologies; educational process; educational programs; cognitive analysis.

Introduction

Currently, a new direction has appeared in management – the theory of knowledge management. Knowledge management is a developing area of scientific and practical activities, the purpose of which is to systematize the work with intellectual resources (assets) and accumulated experience. We cannot manage knowledge in the traditional sense, but we can, according to B. Gates, create such conditions when the necessary knowledge and information will be available at the right time to the right people to perform the necessary tasks. Individuals' knowledge can be expanded and deepened, i.e. managed, for example, by building different formats of training with teachers, tutors or self-study.

Cognitive knowledge management mechanisms can be the key to rapidly improving the effectiveness of knowledge management. Cognitive technologies allow to automate the processes of identification, fixation and exchange of knowledge.

The choice of knowledge management methodology will be productive in the development of educational programs for higher education.

Analysis of recent publications

The existing publications investigate the methods, models and mechanisms of project-oriented management of educational activities of higher educational institutions [1].

Thus, in [2], factors that affect the results and possibilities of introducing key competencies into the activities of an organization are analyzed, and a general algorithm for the transition from direct to dual competence is proposed.

The article [3] analyzes the influence of the requirements for scientific and pedagogical workers, enshrined in licensing conditions, on the parameters of the educational process in a higher educational institution. The degree of sufficiency of these factors for the preparation of a graduate competitive in the labor market is analyzed. A cognitive model based on indicators used to assess an educational institution during licensing and additional indicators characterizing a competitive graduate and student achievement during the educational process is proposed.

The work [4] provides a brief overview of the cognitive approach to modeling and management. A class of management tasks is identified, for the solution of which it is advisable to use cognitive modeling. A method of forming a strategy for solving semi-structured problems based on cognitive models as applied to socio-economic systems is presented. Some directions of further development of the cognitive approach are indicated. The article [5] offers a functional diagram of the cognitive model.

In knowledge management, artificial intelligence methods are also used: neural network [6] and ontological approaches [7]. The technologies of knowledge formation in the distance education system are being developed [8, 9].

Thus, as a result of the analysis of the achievements of scientists in the field of knowledge management of the

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system of training specialists [10 - 14], we found that in the project management methodology, the component associated with the management of knowledge itself is insufficiently studied

The purpose of the work and problem statement. Today, one of the urgent problems is to apply the theory of knowledge management in the construction of the educational process in a modern university, taking into account the specifics and characteristics of an educational institution. Knowledge management should perform the main functions in the practical activities of the organization: the formal presentation and analysis of knowledge management mechanisms (KMMs), a toolkit of cognitive maps is used.

The purpose of the work is to develop a cognitive model of knowledge management for the formation of educational programs in the system of training specialists.

Research objectives:

- to consider the concepts and mechanisms of knowledge management organizations;
- to form a cognitive model of the knowledge management mechanism;
- to consider the systemic indicators of the cognitive model;
- to analyze the structural features of the cognitive model.

The paper uses the method of using areas of knowledge in project management methodology for the introduction of project management mechanisms and tools into the practical activities of educational institutions.

Presentation of the main material

There is every reason to believe that knowledge management in university education should be understood as a process that combines the processes of training, education, professional development of staff and teachers, and the formation of specialist competencies. All these processes combine knowledge if we consider knowledge in its integral form.

Researchers of the problem of knowledge in modern science consider it expedient to single out a type of knowledge that is complex in nature - the so-called living knowledge. They can be defined as personal knowledge based on understanding (theory) and skill (practice), which are constantly included in human activity and are the basis for its development (human competence). This knowledge is the source of the formation of new theoretical and practical knowledge and can be formalized and transferred for use by other people, i.e., there is a diffusion of knowledge.

The knowledge management process should go simultaneously on three main objects: people, processes and technologies [10]. The object "people" involves the establishment of contacts and interaction between people with knowledge (these are students, teachers, employees, employers involved in teaching). The object "processes" is associated with the development of procedures for the exchange of knowledge, mechanisms for motivating and attracting people to participate in the exchange of knowledge (these are basic educational programs, advanced training, the creation and use of the possibilities of the educational environment of the university, the organization of the educational process based on modern scientific and educational provision, research of teachers and students, monitoring the quality of education, etc.). The object of "technology" is focused on the development of technological infrastructure for the preservation of experience and communication (databases of libraries and electronic resources that support educational courses and disciplines, internal networks and other IT solutions in the university, the use of the latest educational technologies in the educational process). Knowledge management in relation to these three objects will provide a real opportunity to build a personal model of education for each student, when, given the same information sources, the student learns to choose what he needs to solve a specific problem. Explicit "traditional" knowledge, recorded in the educational program in "didactic units", combined with the implicit personal knowledge of the teacher, will become the basis for a new personal knowledge of the student. It is this approach that increases the value of an individual, since everyone becomes a bearer of unique knowledge and unique experience built using this knowledge. This once again emphasizes the subjectivity of knowledge. In this case, it is the development of human potential that will be the most important resource in the construction of an educational program, i.e. the educational program will create conditions for the development of the potential of each person.

The formalization of implicit knowledge is an essential element of knowledge management. The task of reflecting tacit knowledge in various educational programs for the training of a specialist (from basic educational to the curriculum of a discipline or course) becomes extremely urgent. It can be solved with the help of mentoring, training or the formation of professional communities, that is, in the course of face-to-face synchronous communication. The importance of solving such a problem, which is to create conditions for the exchange of professional non-formalized knowledge in the company, is constantly emphasized in the manuals on knowledge management.

We believe that the choice of knowledge management methodology will be productive in the development of educational programs for higher education. This is due to the fact that the process of knowledge management should go simultaneously on three main objects: people, processes and technologies [10]. The object "people" involves establishing contacts and interaction between people with knowledge (these are students, teachers, employees, employers involved in teaching). The object "processes" is associated with the development of procedures for the exchange of knowledge, mechanisms for motivating and attracting people to participate in the exchange of knowledge (these are basic educational programs, advanced training, the creation and use of the possibilities of the educational environment of the university, the organization of the educational process on the basis of modern scientific and

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educational provision, scientific research of teachers and students, monitoring the quality of education, etc.). The object of "technology" is focused on the development of technological infrastructure for the preservation of experience and communication (databases of libraries and electronic resources that support educational courses and disciplines, internal networks and other IT solutions in the university, the use of the latest educational technologies in the educational process). Knowledge management in relation to these three objects will provide a real opportunity to build a personal model of education for each student, when, given the same information sources, the student learns to choose what he needs to solve a specific problem. Explicit "traditional" knowledge, recorded in the educational program in "didactic units", combined with the implicit personal knowledge of the teacher, will become the basis for a new personal knowledge of the student. It is this approach that increases the value of an individual, since everyone becomes a bearer of unique knowledge and unique experience built using this knowledge. This once again emphasizes the subjectivity of knowledge. In this case, it is the development of human potential that will be the most important resource in the construction of an educational program, i.e. the educational program will create conditions for the development of the potential of each person.

The most important factor linking the organizational process in a production company, as well as the educational process in a University, is the presence of a certain experience in obtaining knowledge from the subjects of these processes (employees at the enterprise, students and teachers at the University), mastered in the process of obtaining systematic education. Therefore, they have more or less formed the ability to acquire knowledge and act in accordance with the task being solved (i.e., key competencies). This means that general approaches to their further education will be based on these competencies. Moreover, the level of their formation will ultimately determine the success of educational and professional activities.

In modern conditions, knowledge management is of particular importance in the activities of any organizations, including educational ones. It contributes to the creation of a special culture of this organization - in particular, about that part of the corporate culture that encourages employees to constantly exchange important knowledge (this is both scientific discoveries and the tactics of communicating with a "difficult" client), to the creative growth of members of the professional community, to critical relation to one's own experience and "collective" knowledge, etc. It is this part of the culture that serves as the key to the successful development of an organization or university. “In the ideal world of business, every member of an organization has easy access to the knowledge of their colleagues. Employees willingly share their know-how, and the organization is developing rapidly thanks to the continuous flow of new knowledge”- this is the picture painted by well-known researchers of knowledge management theory [11]. However, in the real world of business, the opposite happens most often: knowledge is not shared, but reliably stored and protected. How to convince people to share their knowledge? Knowledge management must answer this question. The way to solve this problem is to establish mutual connections between people and manage processes and technologies. Knowledge management should perform basic functions in the practice of an organization: mediation, internalization, exportation and cognition [15].

Mediation provides people with access to the knowledge available in the organization (institution), brings together those who are looking for certain knowledge and those who currently have such knowledge. Universities as educational institutions have always performed such an intermediary function: they collected, stored, created and provided access to the necessary knowledge to everyone who needed this knowledge.

Export is the establishment of a link between previously unrelated knowledge by placing it in an external storage and further systematization based on certain criteria. At the same time, one should take care of the constant replenishment of knowledge, of the translation of implicit knowledge into explicit (formalized) ones. In the conditions of the university educational process, there is a mechanism for scientific conferences, laboratories, the work of project groups and teams, refresher courses, and other communities that solve the problem of exporting knowledge through its formalization. The main role in the implementation of the function of exporting knowledge in the university belongs to libraries, electronic databases and resources of various kinds, which are constantly being replenished and expanded. However, as practice shows, while there are certain difficulties for employees, teachers and students using these resources. The factors contributing to the occurrence of these problems require more detailed study.

Internalization is a query-based knowledge extraction process. It will be ineffective until knowledge is presented to the user in a form that is convenient for his perception. To solve this problem, you can use the interpretation of data and information (for example, tables, graphs, brief summaries, etc.), as well as filtering knowledge (by analogy with the mechanism for presenting the required information through Internet search resources).

Cognition is the transformation of knowledge into action, when, on the basis of the presented available knowledge, a solution corresponding to a specific task is developed. In this case, the authors consider cognition as a practical implementation of knowledge that participated in the three previous procedures. In our opinion, it is this aspect of knowledge management in a modern university that is most weakly expressed. This is objectively connected both with the relative remoteness of the results of education, and with the vastness and complexity of the range of tasks that have to be solved in the educational process, with the predominance of often intuitive solutions, which is the exclusive ability of human intelligence, while it is impossible to give any recipes and develop algorithms activities. At the same time, this is a very important process for the development of

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professional competencies of a future specialist: after all, it is precisely situational tasks of a high degree of uncertainty that he will have to solve in the changing contexts of professional activity.

These four functions are based on a knowledge management model in which the main task is to teach employees to share their knowledge.

From the point of view of using the theory of knowledge management in a modern educational institution, the forms of practical implementation of knowledge management are attractive [6]. These include: Learning Organization, Knowledge Library and Strategic Awareness:

The learning organization is the pinnacle to which educational institutions, including universities, are striving today. A learning organization is an organization that knows how to create, acquire and disseminate knowledge and changes its behavior in accordance with new information, with original opinions and modern thought patterns. Its mission is to develop a commitment to the innovative spirit of the entire organization - thus acquiring the ability to cultivate a collective knowledge that is less at risk of loss if employees leave. In a learning organization, activities are aimed at developing the intellectual potential of employees, self-training and advanced training mechanisms are used for the constantly changing context of activities and new professional tasks. We are seeing something similar at the present time in the university teaching community, when more and more employees appear who strive to constantly acquire new knowledge, learn, but they need this knowledge to solve specific problems, and not just "for the future". Thus, there is a real embodiment of the idea of continuous education, education throughout life.

The "knowledge library" approach aims to improve the organization's ability to manage new projects and processes. It is based on the creation of a corporate knowledge base intended for the accumulation and dissemination of data on the most effective methods, as well as on previously implemented projects. In this case, it becomes possible to use these results in further projects (the experience of appointing a "chronicler" is also known, which describes everything that happens during the development and implementation of a project, another example is the creation of electronic resources available to all employees of a company or educational institution).

Strategic awareness involves working with large amounts of information and the ability to shrewdly and in a timely manner to extract knowledge from these stores. At the university, such repositories can be created for interaction with employers, for the implementation of recurring projects or for the development of educational and methodological support of the educational process at departments, in directorates of educational programs, in dean's offices of faculties. This knowledge will undoubtedly be important in the development of interdisciplinary disciplines and courses, the number of which will constantly increase and the content will expand in connection with the transition to competence-based programs and new standards of higher professional education.

Cognitive modeling methods are a fairly effective tool for analyzing poorly structured systems. The specified class of systems includes the systems of educational training of specialists.

Thus, cognitive maps can be used to formally represent and analyze knowledge management systems (KMS) [16]. They are a way of displaying cause and effect relationships, which are usually represented as a directed graph:

$$G =< E, W >,$$

where $E = \{e_1, e_2, ..., e_n\}$ is a set of systemic factors called concepts; W – a binary relation at a set E, which defines a set of links between its elements.

Elements e_i and e_j are considered to be related by the relation W, which is denoted as $e_i W e_j$, if a change in the meaning of the concept e_i (cause) leads to a change in the meaning of the concept e_j (influence). Thus, the cognitive model displays the concept e_i of a cause on an influence e_j. If we consider the concept of the intensity of influence, we come to the concept of a fuzzy cognitive map. It expands the concept of a traditional (clear) cognitive map and reflects the fact of differences in the intensity of mutual influence between concepts. Let us define the indicator of the intensity of influence in the form of a fuzzy matrix $A = \{a_{ij}\}, i = \overline{1,n}, j = \overline{1,n}$, the elements of which determine the direction and intensity of influence between the concepts e_i and e_i:

$$a_{ij} = a(e_i, e_j),$$

where a_{ij} is a normalized indicator of the intensity of influence between concepts e_i and e_j.

Thus, we have the characteristic function of the ratio A, which has a number of special properties [16]. Let's note that $a_{ij} \in [-1; 1]$, that is, the intensity indicator is characterized by an intermediate degree of positive or negative influence.

Let us display the object under study in the form of a weighted directed graph, the vertices of which correspond to elements of the set E (concepts), and the arcs correspond to nonzero elements of the relation W, i.e. a causal relationships. Each arc has a weight given by the corresponding value a_{ij}. Let's represent the relation W in the form of a cognitive matrix $A = \|a_{ij}\|, i, j = \overline{1,n}$ of dimension $n \times n$ (n is the number of concepts in the system), which is the adjacency matrix of the given graph.

The current *state of the system* is determined by the values of all FCM concepts. The target state of the system is determined by a set of values for a set of target concepts.

Here are the calculation formulas for the *system indicators of the cognitive model* [16].

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The consonance of the influence of the *i*-th concept on the system is calculated as the average value of the consonance of the influence of individual concepts:

$$\overline{H_i} = \frac{\sum_{j=1}^{n} c_{ij}}{n}, \quad (1)$$

where c_{ij} – the consonance of the influence of the *i*-th concept on the *j*-th concept.

Consonance of the influence of the system on the *j*-th concept:

$$\overline{H_j} = \frac{\sum_{i=1}^{n} c_{ij}}{n}. \quad (2)$$

Dissonance of the *i*-th concept impact on the system:

$$\overline{D_i} = \frac{\sum_{j=1}^{n} d_{ij}}{n}, \quad (3)$$

where d_{ij} – dissonance of the influence of the *i*-th concept on the *j*-th concept.

Dissonance of the impact of the system on the *j*-th concept:

$$\overline{D_j} = \frac{\sum_{i=1}^{n} d_{ij}}{n}. \quad (4)$$

The intensity of the influence of the *i*-th concept on the system:

$$\overline{P_i} = \frac{\sum_{j=1}^{n} a_{ij}}{n}, \quad (5)$$

a_{ij} – the intensity of the influence of the *i*-th concept on the *j*-th concept.

Impact of the system on the j-th concept:

$$\overline{P_j} = \frac{\sum_{i=1}^{n} a_{ij}}{n}. \quad (6)$$

The main indicator is the centralization of the impact of the *i*-th concept:

$$E_i^p = \overline{P_i} - \overline{P_j} = \frac{\sum_{i=1}^{n} a_{ij} - \sum_{j=1}^{n} a_{ij}}{n}. \quad (7)$$

A thorough analysis of the subject area is carried out, according to the results of which a set of factors (concepts) that have the strongest influence on decision-making on knowledge management are identified (table 1). The whole set of concepts characterizes the following aspects of the educational process:

- individual characteristics of students;
- informational and methodological support of the learning process;
- learning outcomes;
- external factors influencing the learning process.

Table 1. *Grouping and characteristics of cognitive model concepts*

No.	Concept name	Concept characteristics
Individual characteristics of students		
1	Basic mathematical knowledge and skills	Has a noticeable effect on the system. In the process of targeted training, this concept is subject to development, which can create the necessary conditions for achieving a tangible positive effect in training.
2	Motivation	It is considered as a significant factor in the learning process model.
3	Cognitive style	Determines the student's ability to successfully master the educational program, has a significant impact on the system.
Information and methodological support of the learning process		
4	Qualification of teaching staff	Significantly strengthens the system through the implementation of a scientifically based policy of personnel management and the introduction of innovative technologies for improving the qualifications of the teaching staff.
5	Science school	Creates conditions for preserving and developing traditions and maintaining the high status of the university.
6	Innovation in the educational process	The impact on the system is relatively small, since the power of the concept's influence on the system can be explained by the cyclical renewal of the methodological systems of education. At the same time, the renewal period can reach (depending on the specifics of the university) 3-4 academic semesters.
7	Teaching staff income	The impact on the system is manifested in many aspects. This issue affects the interests of the teacher as the leading subject of the learning process and requires a delicate study.
8	Study load (classroom hours)	Relatively weakly affects the system, the differentiated approach of the administration to the definition of the teaching load of the teacher, taking into account the volume and quality of the scientific, methodological and educational work performed by him, will create conditions for the activation of individual work with students. On the contrary, strict normative methods of planning the workload will limit the teacher's opportunities in matters of professional development and level the conditions for the growth of the professional competence of university graduates.

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End the **Table 1**

Learning results		
9	Special mathematical competencies (knowledge and skills) of a graduate	It forms the basis for the formation of students of professional competence, including mathematical knowledge, abilities, skills, ways of thinking and acting, as well as the ability to acquire new mathematical knowledge, abilities, skills, ways of thinking and activity, as well as the ability to acquire new mathematical knowledge and use them in further professional activities.
10	Formation of professionally important qualities (knowledge and skills) of a graduate	Allows the student to get a set of intellectual, personal, behavioral qualities of knowledge and skills that make it possible to act adequately in any situation.
11	Readiness of the graduate to solve professional problems	The key component of the system, which is interpreted as a set of knowledge and skills of a special kind, a way of performing professional activities, the integrated implementation of knowledge, skills, know-how and relationships in known or new work situations that allow you to set and achieve goals for transforming situations.
External factors		
12	The demand for a university graduate in the labor market	It can be assessed as a fairly balanced factor. The level of demand for university graduates achieved in the labor market has a positive effect on concepts 2, 5 and 7 and, as a result, corrects the vector of further improvement of the learning process.

It should be borne in mind that the selected factors are interdependent. Therefore, the model of fuzzy cognitive maps is a fully connected graph.

To formalize the procedures of cognitive analysis in knowledge management, it is necessary to present a sequence of procedures for transforming the initial matrix $A = \|a_{ij}\|, i, j = \overline{1,n}$ into a transitively closed cognitive matrix containing the information necessary to determine the system characteristics of the FCM [17].

Fig. 1 shows the graph of the network cognitive model of the knowledge management mechanism.

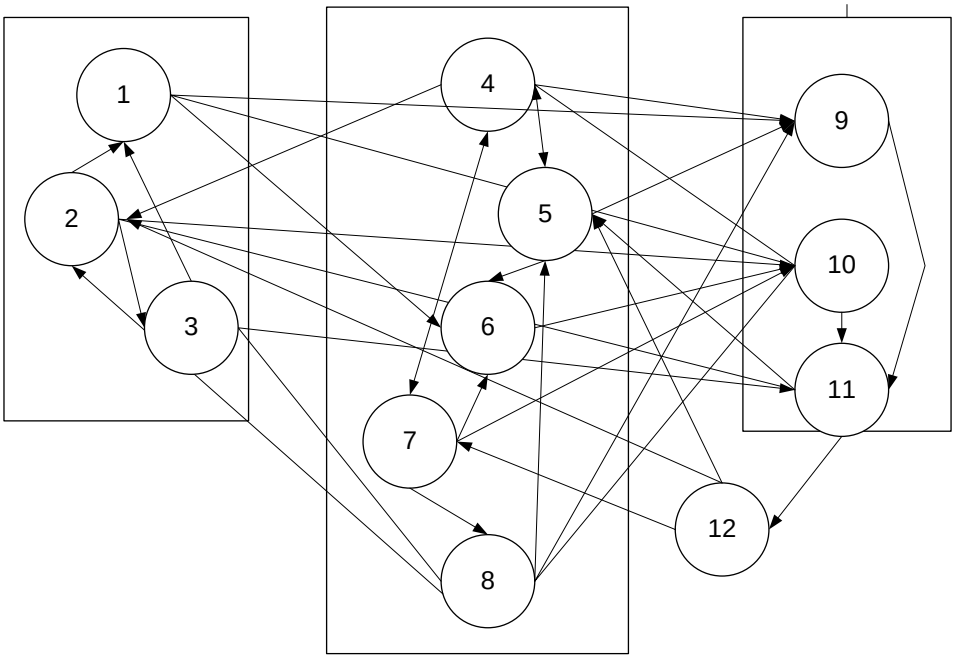

Fig. 1. Graph of network cognitive model of knowledge management mechanism

Based on the results of the analysis, it is possible to draw conclusions about the greatest positive effect from a coordinated change in the group of model concepts that provide a sustainable impact on the system through cause-and-effect relationships. For example, in fig. 1 one can distinguish such sequences of influence of concepts: "$3 \to 1 \to 9 \to 11$" и "$5 \to 4 \to 7 \to 10$".

Critical analysis and assessment of the organization's knowledge management potential contribute to decision-making in project management of the development of educational institutions.

Conclusions

The formal representation of the knowledge management mechanism in the form of a cognitive map allows to generalize and systematize the accumulated research experience in order to identify patterns and quantify the impact of the most significant factors in the training process.

As a result of the cognitive analysis of the FCM, a group of factors (concepts) was identified, the coordinated

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change (adjustment) of the characteristics of which can provide a significant increase in the quality of training.

The results obtained can become the basis for further research on knowledge management mechanisms, which are considered as a promising direction in projects for the development of higher education.

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Чернова Любава Сергіївна – кандидат технічних наук, Національний університет кораблебудування імені адмірала Макарова, доцент кафедри інформаційних управляючих систем та технологій, Миколаїв, Україна; email: 19chls92@gmail.com; ORCID: https://orcid.org/0000-0002-0228-6677.

Чернова Любава Сергеевна – кандидат технических наук, Национальный университет кораблестроения имени адмирала Макарова, доцент кафедры информационных управляющих систем и технологий, Николаев, Украина.

Chernova Liubava – PhD (Engineering Sciences), Admiral Makarov National University of Shipbuilding, Associate Professor of the Department of Information Control Systems and Technologies, Mykolaiv, Ukraine.

Чернова Людмила Сергіївна – доктор технічних наук, Національний університет кораблебудування імені адмірала Макарова, доцент кафедри інформаційних управляючих систем та технологій, Миколаїв, Україна; email: lyudmylachernova@gmail.com; ORCID: https://orcid.org/0000-0002-0666-0742.

Чернова Людмила Сергеевна – кандидат технических наук, Национальный университет кораблестроения имени адмирала Макарова, преподаватель кафедры информационных управляющих систем и технологий, Николаев, Украина.

Chernova Lyudmyla – PhD (Engineering Sciences), Admiral Makarov National University of Shipbuilding, Lecturer of the Department of Information Control Systems and Technologies, Mykolaiv, Ukraine.

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КОГНІТИВНЕ МОДЕЛЮВАННЯ МЕХАНІЗМІВ УПРАВЛІННЯ ЗНАННЯМИ ПРИ ПІДГОТОВЦІ ФАХІВЦІВ

Предмет дослідження в даній статті – управління знаннями при підготовці фахівців в проектно-орієнтованих організаціях, зокрема, вищих навчальних закладах. **Мета** роботи – розробити когнітивну модель управління знаннями для формування освітніх програм в системі підготовки фахівців. Завдання дослідження: розглянути поняття і механізми управління знаннями організацій; сформувати когнітивну модель механізму управління знаннями; розглянути системні показники когнітивної моделі; провести аналіз структурних особливостей когнітивної моделі. У роботі застосовано **методи**: методологія управління проектами (управління знаннями), системний підхід, когнітивні і графові моделі. **Результати**. У статті наводиться визначення «управління знаннями», розглядаються умови, коли потрібні знання і інформація стануть доступні для виконання завдань. Розглянуто питання урахування специфіки та особливостей освітнього закладу. Застосовуються **методи** управління знаннями в побудові освітнього процесу в університеті. Наведено основні функції в практичній діяльності організації: посередництво, експортування, інтерналізація, пізнання. Також розглянуті форми практичної реалізації управління знаннями: навчальна організація, бібліотека знань і стратегічна обізнаність. У статті також розглядається можливість основних положень теорії управління знаннями в освітньому процесі, так як підвищення якості підготовки фахівців є метою будь-якої освітньої системи. У статті розроблена когнітивна модель механізму управління знаннями, на основі когнітивного аналізу виявлені корисні закономірності, які відображають вплив факторів різної фізичної природи на результати підготовки фахівців. **Висновки**. Когнітивне моделювання може стати ключем до швидкого підвищення ефективності управління знаннями при підготовці фахівців. Класичний підхід до управління знаннями вимагає високого рівня залученості співробітників у відповідні процеси, оскільки їм необхідно самостійно виявляти знання, обмінюватися ними, фіксувати їх і застосовувати. Когнітивне моделювання може знизити цю вимогу, оскільки дозволяє упорядкувати процеси виявлення, фіксації, зберігання та обміну знаннями. Крім того, вони підвищують застосовність знань, пропонуючи відповідні з урахуванням контексту студента. Накопичений досвід когнітивного моделювання складних організаційних систем управління дозволяє на принциповій основі підійти до дослідження механізмів управління знаннями при підготовці фахівців. Отримані результати пропонується використовувати для налаштування механізмів управління знаннями з метою підвищення якості підготовки.

Ключові слова: управління знаннями; когнітивні технології; освітній процес; освітні програми; когнітивний аналіз.

КОГНИТИВНОЕ МОДЕЛИРОВАНИЕ МЕХАНИЗМОВ УПРАВЛЕНИЯ ЗНАНИЯМИ ПРИ ПОДГОТОВКЕ СПЕЦИАЛИСТОВ

Предмет исследования в данной статье – управление знаниями при подготовке специалистов в проектно-ориентированных организациях, в частности, высших учебных заведениях. **Цель** работы – разработать когнитивную модель управления знаниями для формирования образовательных программ в системе подготовки специалистов. **Задачи** исследования: рассмотреть понятия и механизмы управления знаниями организаций; сформировать когнитивную модель механизма управления знаниями; рассмотреть системные показатели когнитивной модели; - провести анализ структурных особенностей когнитивной модели. В работе применен методы: методология управления проектами (области управления знаниями), системный подход, когнитивные и графовые модели. **Результаты**. В статье приводится определение «управление знаниями», рассматриваются условия, когда нужные знания и информация станут доступны для выполнения задач. Рассмотрен вопрос учета специфики и особенностей образовательного учреждения. Применяются **методы** управления знаниями в построении образовательного процесса в университете. Приведены основные функции в практической деятельности организации: посредничество, экспортирование, интернализация, познание. Также рассмотрены формы практической реализации управления знаниями: обучающая организация, библиотека знаний и стратегическая осведомленность. В статье также рассматривается возможность основных положений теории управления знаниями в образовательном процессе, так как повышение качества подготовки специалистов является целью любой образовательной системы. В статье разработана когнитивная модель механизма управления знаниями, на основе когнитивного анализа выявлены полезные закономерности, которые отражают влияние факторов различной физической природы на результаты подготовки специалистов. **Выводы**. Когнитивное моделирование может стать ключом к быстрому повышению эффективности управления знаниями при подготовке специалистов. Классический подход к управлению знаниями требует высокого уровня вовлеченности сотрудников в соответствующие процессы, поскольку им необходимо самостоятельно выявлять знания, обмениваться ими, фиксировать их и применять. Когнитивное моделирование может снизить это требование, поскольку позволяет упорядочить процессы выявления, фиксации, хранения и обмена знаниями. Кроме того, они повышают применимость знаний, предлагая подходящие с учетом контекста студента. Накопленный опыт когнитивного моделирования сложных организационных систем управления позволяет на принципиальной базе подойти к исследованию механизмов управления знаниями при подготовке специалистов. Полученные результаты предлагается использовать для настройки механизмов управления знаниями с целью повышения качества подготовки.

Ключевые слова: управление знаниями; когнитивные технологии; образовательный процесс; образовательные программы; когнитивный анализ.

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