DETAILING OF THE MAIN DIRECTIONS AND COMPONENTS FOR DEFINING MODELS FOR ASSESSING THE QUALITY OF KNOWLEDGE

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ABSTRACT

The subject of research in the article is the perception, processing and transmission of data as one of the components used in various knowledge processing systems. Objective: to analyze such systems aimed at obtaining data, their dissemination, forming a knowledge base and conducting various assessments to determine the degree of data transformation into knowledge, the formation of adequate and simple queries to relevant knowledge bases in order to develop the necessary competence, knowledge dissemination and mastering (loss) of such knowledge during a certain period of time (phase of mastering or formation of knowledge). The following tasks are solved in the article: development of a management system from the point of view of knowledge formation in the educational process, which is reduced to a stable definition of input and output information flows, which are influenced by the "subject of knowledge" and "recipient of knowledge". These managerial influences that determine, in general, the detailing of the main directions and components for the definition of models for management in knowledge processing systems. The following results were obtained: analyzed the relevance of the scientific problem, the essence of which is that the results of the analysis in the educational process can be divided into separate levels of so-called "subjects of knowledge", such levels can be formed according to individual educational programs, courses, areas, etc. Conclusions: The developed system shows that knowledge forms the input stream, and inverse queries and responses form the output stream of the general formation of knowledge in the educational process. Consequently, the provision and development of relevant knowledge as a whole determines the general formation of knowledge, which is subject to the appropriate management influences and is one of the components of the knowledge processing management process.

Keywords: Assessment of the quality of knowledge, Knowledge formation, Knowledge processing, Subject of knowledge, Recipient of knowledge

1. INTRODUCTION

A classic example of systems for the formation and transfer of knowledge can be considered systems for obtaining knowledge that are used in the educational process [1]. Such systems are usually characterized by:

- a certain level of their computerization, which determines the transfer of relevant information from the subject who has the knowledge to the subjects who acquire this knowledge in order to acquire a certain competence (for example, in accordance with a particular educational program);
- the possibility of introducing remote access systems for the dissemination and provision of knowledge to various entities that master them. Therefore, it is common to form and master knowledge without direct communication between those who provide such knowledge and those who need such knowledge. Therefore, it imposes its requirements on the assessment of knowledge in distance learning systems [2, 3].

2. ANALYSIS OF THE PROBLEM AND EXISTING METHODS

The classical model of the knowledge acquisition system of the corresponding educational process can be represented as, N subjects providing knowledge to M subjects who acquire this knowledge thanks

to a certain communication subsystem. These subjects and the subsystem of communication between the subjects form a certain environment for acquiring knowledge in the educational environment. In addition, it should be noted that knowledge forms the input flow, and feedback and answers - the output flow of the general formation of knowledge in the educational process. Thus, the provision and acquisition of relevant knowledge in general determine the general formation of knowledge, which is subject to the relevant managerial influences and is one of the components of the process of managing the processing of knowledge.
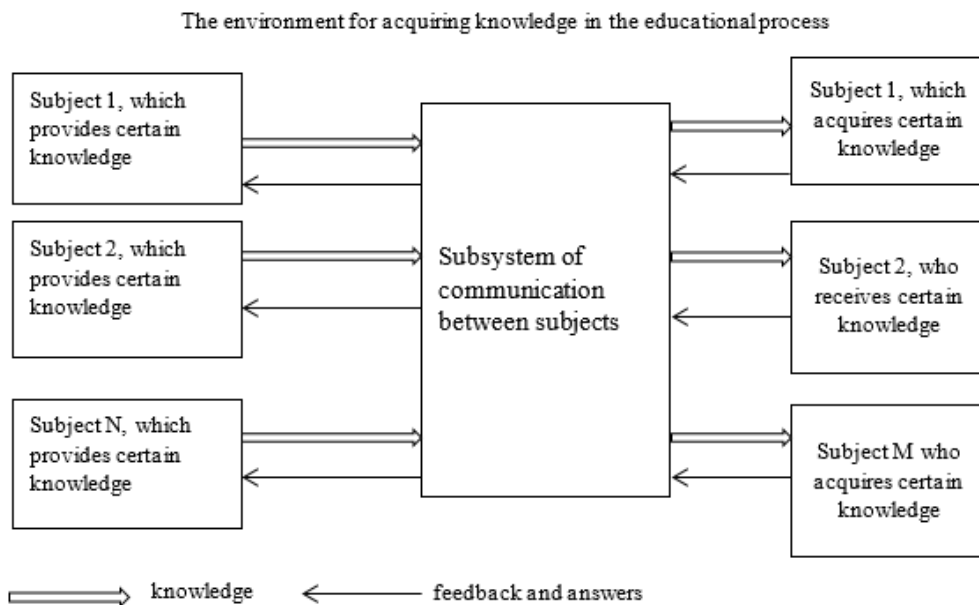
The environment for acquiring knowledge in the educational process

Figure 2.1 - Classical model of knowledge formation in the educational process

It is such managerial influences that determine the overall detail of the main directions and components for defining management models in knowledge processing systems. To reveal such managerial influences, we will reveal in more detail the main components of the classical model of knowledge formation in the educational process in accordance with the above picture 1.

Thus, the subject who imparts knowledge further, the "subject of knowledge", generates the initial flow of such knowledge (V) on the basis of available information and perceives in the opposite direction various requests, which is the basis for determining the level of acquired knowledge. The flow of knowledge, which goes from the "subject of knowledge" to the subject who receives knowledge (hereinafter "recipient of knowledge") contains, first of all, information that must be mastered and assimilated. Therefore, the "subject of knowledge" is formed by control influences, first of all, on the acquisition of knowledge by the "recipient of knowledge". At the same time, the reverse influences determine the reverse flow, which is pushed by the "subject of knowledge" to assess the level of knowledge formed by the "recipient of knowledge" and, if necessary, adjust the initial flow of knowledge. Therefore, the general management from the point of view of the "subject of knowledge" should be defined in accordance with the solution of such sub-tasks as:

- the formation of knowledge in the "recipient of knowledge" (define it in a formalized form as FZ),
- assessment of the level of knowledge by the "recipient of knowledge" (define it in a formalized form as OZ). In this case, such estimates can be both generalized and in terms of providing a certain amount of input information. That is, in general, V - the input stream is a set of individual streams (k), which in general can determine the level of knowledge generated by the "knowledge recipient": $V = \{V_1, V_2, ..., V_k\}$. Then we can have a general assessment of the level of knowledge ($OZ(V)$), or

current assessments of the level of knowledge $(OZ(V_1), OZ(V_2), ..., OZ(V_k))$.Hence, the formation of knowledge as a certain set in accordance with the individual components of the overall input flow V.

Adjustment of the input flow of information on the acquisition of knowledge by the "recipient of knowledge" in the case of such a need (define it in a formalized form as). According to the above, the adjustment of the input stream is also carried out in accordance with the individual components of the total input stream V.

In particular, certain tools for adjusting the input stream include: providing additional information, expanding the basic information and its clarification, reformatting the information provided. Such actions are conditioned by the need to fully master the input information, adjust it if necessary, or update the knowledge that the "recipient of knowledge" has available (expansion of the so-called residual knowledge). That is, in general, the formalization of the management of knowledge processing in terms of "subject of knowledge" can be defined as such a tuple of parameters:

$$\langle FZ, OZ, KZ \rangle \qquad (1)$$

Then some formalizations of control models can be reduced to a certain control function according to the parameter from the above tuple for 1. For example, you can define W_1 a control function that reveals the need to adjust the input flow of information to obtain knowledge "knowledge recipient" according to current estimates of the level of knowledge of such "knowledge recipient":

$$W_1(OZ) = \begin{cases} FZ(KZ_1), if\ OZ(V_1) \leq E_1, \\ FZ(KZ_2), if\ OZ(V_2) \leq E_2, \\ ... \\ FZ(KZ_k), if\ OZ(V_k) \leq E_k, \end{cases} \qquad (2)$$

Where $E_1, E_2, ..., E_k$ - the individual values of acceptable levels of knowledge of the "recipient of knowledge" in accordance with the components of the input stream $V = \{V_1, V_2, ..., V_k\}$. That is, the function W_1 is an example of the formation of managerial influences from the point of view of the "subject of knowledge" taking into account the obtained level of such knowledge by the "recipient of knowledge". Thus, the key issues in this aspect are both the definition of the general model of knowledge formation (for the provision and acquisition of relevant knowledge in general) and, accordingly, the choice and definition of the model, method of assessing the level of such knowledge.

At the same time, the "knowledge recipient" not only perceives the input stream, but also forms the output stream (VZY). The output stream is formed from queries (Z) and answers (Y). In general, queries can be emotional, but they are an integral part of determining the need to adjust the input stream. In general, queries can be emotional, but they are an integral part of determining the need to adjust the input stream.

Moreover, such requests may reveal the directions of such adjustment of knowledge. At the same time, the answers determine the assessment of the level of knowledge by the "knowledge recipient", as well as influence the determination of the need to adjust the input flow. Thus, we must distinguish two elements - qualitative and quantitative, which affect such a characteristic of the "subject of knowledge" as the need to adjust (KZ) the input stream (V).In some way, this feature affects the rationale for the choice of models for the formation of knowledge, where it is necessary not only to

quantify such models, but also the need to take into account the qualitative features of management during the development of these models.

In this case, the formation of managerial influences in terms of "recipient of knowledge" is:

- in the acquisition of knowledge provided by the "subject of knowledge" (define it in a formalized form as RZ),
- in determining and clarifying the need to adjust the input flow of information as a function of the components of the output flow (in a formalized form, it is advisable to submit through the appropriate specification in accordance with the above dependence $KZ(Z, Y)$).

In this case, the tuple of formalization of knowledge management in terms of "recipient of knowledge" can be presented as follows:

$$\langle RZ, Z, Y \rangle \qquad (3)$$

Then the generalized formalization of the corresponding managerial influence is reduced to a certain management function according to the parameter from the given tuple for 3. For example, it can be clarification of formation of knowledge according to components of an initial stream through generalization of separate inquiries.

(Z) and answers (Y) of different "knowledge recipients":

$$FZ(KZ) = \begin{cases} FZ(KZ_1), \text{if the number is the same } Z \le D_1, \\ FZ(KZ_2), \text{if the number is the same } Z = D_1, \\ ... \\ FZ(KZ_M), \text{ if the number is correct } Y = D_2, \end{cases} \qquad (4)$$

Where D_1, D_2 - quantitative assessments of acceptable indicators of inquiries and responses of "knowledge recipients".

In general, this content of management in terms of knowledge formation in the educational process is reduced to a stable definition of input and output information flows, which are influenced by the "subject of knowledge" and "recipient of knowledge". The criterion for such management is the assessment of the level of knowledge "recipient of knowledge". The corresponding disclosure of individual elements of the content of knowledge management in terms of knowledge formation in the educational process is shown in Figure 2.
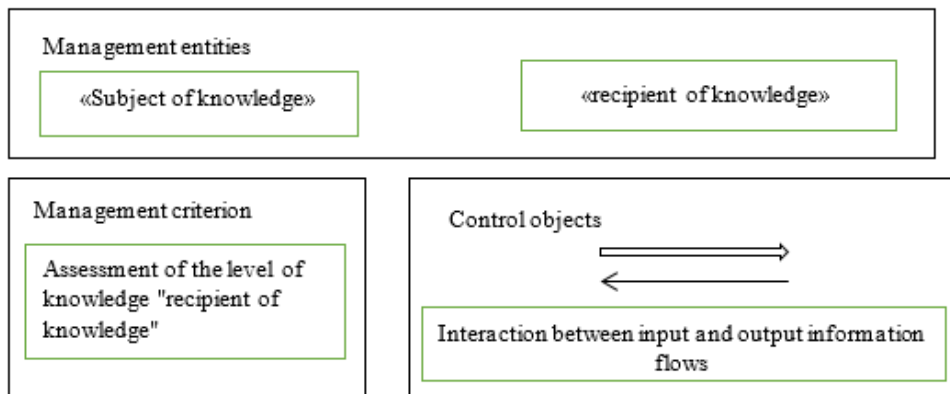

Figure 2.2. Disclosure of individual elements of the content of knowledge assessment management in terms of knowledge formation in the educational process

It should be noted that the formation of appropriate models is caused by the subsystem of communication between the subjects. It is this subsystem that determines how to form knowledge, how to provide the necessary information. In addition, these issues are crucial when such a subsystem is characterized by computerization and the ability to generate knowledge through remote access. Therefore, we are talking about the choice of forms and means of knowledge formation, which, in particular, in terms of the introduction of the remote access subsystem is essential. This is due to the fact that it already allows you to choose certain information technologies for the formation of knowledge. An equally important point in detailing the main directions and components for defining models for the management of knowledge processing is to take into account the multiplicity of "subjects of knowledge" and "recipients of knowledge". In particular, in the educational process it is possible to allocate separate levels of so-called "subjects of knowledge", such levels can be formed according to separate educational programs, courses, directions, etc. As an example we can consider:

- "subject of knowledge" according to a certain educational program, which conditionally determines the first level of knowledge management;
- In the future, such programs can be considered in terms of individual loans for certain phases of knowledge acquisition (for example, these are separate semesters), which will conditionally determine the second level of "subjects of knowledge" in the management of knowledge processing;
- the third level of the "subject of knowledge", which in general defines, coordinates and forms the management of knowledge processing, where the example of the educational process can be considered as a function of the dean's office.

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CONFLICT OF INTEREST

The authors stated that there are no conflicts of interest regarding the publication of this article.

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