THE ROLE OF TASK AT THE ACHIEVING OF META-OBJECTIVE EDUCATIONAL RESULTS IN SCHOOL COURSE OF INFORMATICS

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Brief analysis of new educational requirements is given in the article; the proof of the possibility of their achievement at school lessons on Informatics by solving tasks is done. An example of organization of task solving process aimed to achieve meta-objective educational results is given.

Keywords: educational standard, meta-objective educational results, objective educational results, sorts of educational activities, tasks solving.

РОЛЬ ЗАДАЧИ В ФОРМИРОВАНИИ МЕТАПРЕДМЕТНОГО ОБРАЗОВАТЕЛЬНОГО РЕЗУЛЬТАТА ПО ИНФОРМАТИКЕ

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В статье приводится краткий анализ требований к новым образовательным результатам, делается обоснование возможности их эффективного достижения на школьных уроках информатики в процессе решения задач. Приводится пример организации деятельности учащихся по решению задач на предметные виды деятельности.

Ключевые слова: образовательный стандарт, метапредметные результаты обучения, предметные результаты, виды учебной деятельности, решение задач.

There are practical tendencies of development of the school course of

Informatics that consist in numerous redeterminations of main objectives and the content of education for a relatively short period of existence of this subject at school. In scientific transactions devoted to the history of development of Informatics as a school discipline (S.A.Beshenkov, A.A.Kuznetsov, L. S. Lapchik, V. S. Lednev, E.A.Rakitina, I.G.Semakin, etc.) the main stages of its formation are reflected, according to A.S.Beshenkov, they can be represented as a conversion "from computer literacy to a general education subject, from the general education subject to a "meta-discipline" [7], which passed in several stages. Today Informatics is considered as a natural-science discipline studying regularities of passing of information processes in systems of various nature, and also methods, means and technologies of their automation. According to K.K.Kolin, nowadays Informatics as the fundamental science, "has a great impact on many areas of scientific researches, giving them its scientific methodology (methodology of information modeling, information approach to the analysis of various objects, processes and phenomena in the nature and society)" [2]. Thus, following V.S.Lednev's [3] general concept, the structure of the content of school Informatics includes such general scientific concepts, as model, algorithm, system, and such activity methods as universal methods and tools of reality learning, for example modeling and the activity system analysis. Such structure of the content of the course allows to focus it on formation of a scientific outlook, training of general educational skills of data handling, preparation of the graduate for continuation of education and professional activity in information society, and in general to speak about Informatics as a meta-discipline.

The meta-objective direction of development of Informatics completely coincides with the new concept of Federal State Educational Standards for school (FSES). Changing of paradigm of school education is caused by demands to the graduate which are determined by increasing social and technological changes connected with fast development of information technologies (IT) and enlarging of spheres of their using. The graduate must have not only objective educational results and motivation to a cognitive activity for successful socialization in information

society, but also an ability to get new knowledge and an ability of continuous self-education and self-development. Responding to requirements of the personality, the state and the society, school education has to provide learning of general scientific concepts and universal educational actions (the majority of which have information essence), and also an ability to use them in tasks solving. These requirements are reflected in FSES in the form of new personal, objective and meta-objective educational results. School course of Informatics has a considerable potential in formation of all types of new educational results, and first of all, meta-objective ones.

Requirements to meta-objective educational results summarize requirements of developing universal educational actions (UEA), IT-competence, skills of educational research and design activity, and also semantic reading and analysis of the text. The majority of requirements are formulated in an activity form as general educational skills which display developed activity methods. Thus, a basis of meta-objective educational results, according to FGOS, is "general scientific concepts and universal educational actions, and an ability of using them in educational, cognitive and social practice" [11].

The term "universal educational actions" can be defined as "a set of pupil's action methods (and also studying skills related to them) that provide his or her ability of self-learning new knowledge and skills, including organization of this process". The authors of the Program of development of universal educational actions, its methodologies and the model are the group of scientists under the supervision of A.G. Asmolov. According to the Program, the general scheme of formation of UEA should include: defining school subjects which are most valid for formation of certain types of UEA; defining a certain form of UEA for each subject; developing the task system solving of which provides formation of demanded properties of UEA [12].

However orientation of the course of Informatics to achievement of meta-objective educational results by school students raises a number of new problems to solve.

One of the problems is the absence of a common definition of meta-objective results of studying Informatics at school. In FSES only general requirements are formulated, but they need to be concretized. The analysis of the projects of sample educational programs on Informatics for the basic school [1, 5, 6, 8], and also the educational and methodical books by various authors [9, 10], allows to find out a lot of approaches to the solution of this problem. Having generalized them all, we came to the conclusion that the final set of planned meta-objective educational results of studying Informatics could be as:

The ability to set the purpose independently, to formulate an educational task correlating the known with the unknown.

The ability to search and define the necessary information, to apply information search methods, including using computer means.

The ability to predict, anticipate the result of solving of an educational task.

The ability to define the sequence of intermediate purposes independently, taking into account the final result.

The ability to make a plan and a sequence of actions, to create an algorithm of solving problems of creative and search character independently.

The ability to choose the most effective ways of solving tasks depending on specific conditions.

The ability to control self-activity by comparing the action method and its result with a standard in order to detect deviations and differences from the standard.

The ability to correct and make necessary additions and changes to the plan and action method if the predicted result and the obtained result differ.

The ability to estimate correctness and quality of the solution of the educational task.

The ability to structure information, to choose criteria for comparison, assessment and classification of objects.

The ability to carry out actions with sign and symbolic means, including creation and transformation of models.

Opinions of scientists and authors of educational and methodical books on the structure of meta-objective educational results differ as much as views on what an objective educational result of studying Informatics is. At the same time, there is one more problem to solve, and that is how to apply traditional tools to provide formation of not only objective, but also meta-objective educational result at lessons of a certain school subject, if conventional methods of education focus on the development of objective educational results only.

In scientific transactions [4, 7] it is said that the meta-objective nature of Informatics causes meta-objective educational results of studying the course to be forming as a set of abilities in the process of task solving. At the same time, a meta-objective ability cannot be developed without doing corresponding UEA. Thus, the final scientific problem is to select such tasks which would provide using UEA and working them through. Concerning Informatics these will be tasks on doing certain subject types of activity.

By the term "a task on a certain subject type of activity" we understand a set of tasks of various levels of difficulty (depending on reproductive or productive character of the activity, or the existence or lack of a support in the form of a defined purpose). All tasks have to be unified by conditions of the solution. To define the approach to the selection or formulation of such tasks it is necessary to consider a task as a system of the content (the subjective part) and the process of solving (the procedural part). The subjective part of a task on Informatics depends on a certain topic of the course, and the procedural part – on types of activity which are carried out within its solving.

For example, let's consider the following set of tasks.

Task 1. Read the following advertisements:

- "Only until the end of December! Only from authorized dealers! Buy the latest Porsche for only 2 million rubles and receive a discount of 2% for tuning".

- "Only in our shop you buy washing powder and receive the second one for free!"

- "Beauty shop offers a full range of hairdresser's services at festive prices".

- "We offer in stock in Moscow slabbing, circular, conical dental cutters, taps and reamers. Low prices from the manifacturer!" {the example is given as a set of unclear terms for the person solving the task}

- "McDonald's! Healthy food for all the family!"

Answer questions:

1) Give examples of categories of buyers to which these messages are addressed. Why do you think so?

2) Explain why you don't consider yourself the target audience of some messages.

3) Change advertisements to increase their target audience.

4) Give examples of situations in which these messages lose relevance and timeliness.

While solving this task, pupils interpret various messages from the point of view of their sense, syntax, value, relevance, timeliness, etc.

Task 2. You are given some search inquiries and purposes of search. Use each of the given inquiries and define which of them gives the result satisfying the purpose of the search.

Task 3. You are given some search inquiries and purposes of search. Use each of the given inquiries to correlate inquiries and the search purposes.

While solving these tasks, pupils make the analysis and the assessment of relevance of search results, modification of the search inquiry according to statements of the problem.

Task 4. You are offered a set of properties of an object, a process or a phenomenon, and a modeling purpose. Define whether this set is sufficient and irredundant for creation of the model or not.

Task 5. You are offered a set of properties of an object, a process or a phenomenon, and some purposes of modeling. Defin, for which purpose of modeling this set of properties is optimal.

While solving these two tasks, pupils carry out the system analysis of the object, reveal the properties essential from the point of view of the purpose of modeling.

Thus, solving of offered tasks, namely the analysis and the assessment of properties of the object, the assessment of adequacy of the object to the task (on the basis of the analysis and forecasting of the result of using of this object), generalization of results of the object use in different conditions, interrelation identification between conditions of use and the result promotes formation of the ability "to estimate whether the task is solved correctly", that is to achieve a certain meta-objective educational result while studying Informatics.

Consequently, we suggest the described approach for formulating or selecting tasks for each kind of activity on Informatics. They make a set which is sufficient for achievement of goals, but can be supplemented.

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