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FORMATION OF THE METHODOLOGICAL SKILLS OF FUTURE TEACHERS OF MATHEMATICS

In Uzbekistan teacher of mathematics is to carry out different kinds of activities during his practical work. We should consider teaching activity as a totality of specific activities including the following items: analyzing of various literature together with programs, handbooks, educational-methodical complexes and other means of teaching and on this basis, considering age possibilities of school-children, processing of the needed material and designing of subject contents of the lesson or any other kind of practical work with school-children from it; planning of your work and teaching the children how to plan their study; organizing of different kinds of activity of school-children, rendering them help and in some way managing them; appreciating of your activity and activity of the children and finally teaching them how to appreciate others and themselves in a proper way.

The noted kinds of activity, of course, do not cover all kinds of activity that can be needed by teacher in his practical work. But, first of all, all kinds of activity cannot be foreseen beforehand as practice is more varied than any systematization. Secondly, in the beginning of his career a person should possess some basic skills and form self-estimation and then continue and develop his education and professional skills.

Orientation to the basic kinds of activity of a teacher of mathematics is considered the main principal of forming of his professional skills. The second factor that makes an essential influence on the primary level of formation of the professional skills is marking out of the main unit of organization of the educational process – a lesson. Actually, on the lesson teacher forms all sides of educational activity of a student. This is why teaching activity should be concentrated in the framework of the lesson.

There are different ways of interpretation of the concept “skills”: a) skills as a mastered action; b) skills as an ability to use available knowledge; c) skills as a totality of abilities; d) skills as an incomplete technique or one of the essential steps in developing of skills etc. [1, p.164]

The most up-to-date and prospective approach to study of this concept is considering it in the practical framework. The structure of educational activity includes the following components: educational-cognitive demands and motives; educational-cognitive goals; activities and operation meant to realize educational-cognitive goals; reflection and analysis and on their basis effect

of estimation and self-estimation of the realized educational-cognitive activity.

As it was mentioned before, teaching activity should be considered as a totality of activities where many of these activities have in their basis educational-cognitive activity. Therefore interpreting the concept “skills” we should proceed from the structure of educational activity. Educational activity is realized with the help of some educational-cognitive actions. That’s why skills can naturally be interpreted as a mastered action. At this time level of mastering the action is an objective fact. It can be determined by task, directive, recommendation or question. Skill is a subjective fact i.e. characteristics of mastering activities of a certain person. Activities are in significant degree correlated with teaching material, skills – with a person.

Nevertheless, pointless interpretation of skills as mastered actions does not give a good idea of the structure of this concept. Activities can be estimated through operations, and the latter have different nature. Operations can be **mechanical** – as operations in twisting in screw-nuts and **intellectual** - selection of knowledge for proving a theorem, operations in planning of teaching material, operations in substantiating of existence of some object etc. Educational-cognitive activities have intellectual structure and this is where their essential feature. The other essential feature of educational-cognitive actions is their double basis. From one side, there are some activities that refer directly to the studied subject. For instance, activities on expansion of square trinomial into multipliers, constructing of triangular similar to quantity, providing of the

similar or items etc. Such the activities are often called specific or subjective. From the other side, there are general educational and general cognitive activities which are not connected directly with study of one or another educational subject, however they must be formed in a certain degree and be used at teaching certain educational subjects. Such the activities include: analysis and synthesis, comparison and classification, proving and bringing to conception etc. To form educational activities it is necessary, as V.V. Davidov says, “...provide educational activities with a certain form of subject, and moreover, educational skills of students are formed on the basis of carrying out activities in “the process of prolonged learning of certain subjective knowledge.” [2, p.202-207.]

Thus, learning skills of students are formed during study of the subject of mathematics on the basis of synthesis of subjective and general educational-cognitive activities in the process of prolonged learning of the mathematical knowledge.

Levels of the formed skills may be different. For educational-cognitive skills they usually point out three levels: 1) level of reproduction; 2) level of usage of the skills in a similar situation; 3) level of creative usage of the skills in a new non-standard situation.

Educational activity will be formed when a student is involved in self-study. This means he must be able to do activities of motivation, statement of educational tasks, selection of substantial means and educational activities for solution of educational tasks, activities of estimation and self-estimation. [3]

Thus, educational skills are activities on realization of the educational activity, these activities being a synthesis of general educational-cognitive and subjective actions.

To find out the contents and an appropriate set of methodical skills of a teacher of mathematics it is necessary to clear up essence of professional actions of a teacher.

Among methodical skills there are also such general educational-cognitive activities as analysis and synthesis, generalization and concrete definition, comparison and classification.

The contents of activity of a teacher of mathematics is based upon the certain professional knowledge: knowledge of different aspects of the matter of statement of the goals in teaching mathematics (goals of themes to be studied, units, methods, working out of tasks, proof of mathematical statements etc.); knowledge of ways of acceptance of the goals of the educational material to be studied; knowledge of the specificity of educational, mathematical and methodical tasks and ways of their formulation and statement; knowledge of actions and appropriate operations for working out certain classes of mathematical and educational tasks; knowledge of means of teaching, ways of their usage during teaching different aspects according to the goals and methods of teaching; knowledge of ways of organization of students' activity and managing this activity; knowledge of different forms of control and ways of estimation of activity of students and formation of self-estimation of students. [4]

We have provided the basic professional theoretical knowledge. Previously we called the basic actions of the professional character. To change these actions into professional and methodical skills one should work out educational and methodical tasks for a long period of time.

The first level of formation of the methodical skills comes to understanding of the aim of carrying out of one or another methodical or educational-cognitive action, comprehension of its operational structure, search of ways of carrying out on the basis of the pattern offered in the instructions. [5]

The second level is a transfer of separate formed methodical skills and sometimes of the whole complexes to the basic subjective and bigger blocks, transfer of educational material to the mathematical method, theme, type of mathematical tasks etc. This transfer is usually used on the basis of realizing of the goals and by way of usage of general recommendations and heuristics.

The third level is a highly developed methodical skill which is determined by realizing of not only the goals but also motives and means of selection of ways of activity. This level is characterized by usage of different means and methodical skills according to a certain pedagogical situation.

According to the levels of formation of the methodical skills, their subjective complication and specificity of application in teaching practice these skills can be divided into several groups. Here we provide one of possible sub-groups of the methodical skills. [6]

The first group of the methodical skills is in a significant degree connected with the first level of their formation: ability to make a logical-mathematical analysis of definitions of the mathematical concepts, mathematical statements, formulas, algorithms, subjective mathematical tasks; ability to make a logical-didactic analysis of a concrete, the most minimum, substantial, completed item or paragraph of the educational material; ability to organize a search of working out of the mathematical task, proof of a mathematical statement; ability to select tasks for teaching concepts, proof of mathematical statements, formation of a rule or construction of algorithm; ability to make elementary teaching or visual aid, materials for slide; ability to select literature for studying of a certain aspect (theorem, task, paragraph of a handbook) and make up a proper card index; ability to make up a system of questions for frontal check up of comprehension of a certain knowledge (concept, theorem, rule etc.), ability to estimate written or control work, tests and to analyze their results; ability to place the material

on the blackboard, to put into shape solution of a subjective task, proof of the mathematical statement, value of numerical expression with a variable quantity etc.

The second group of the methodical skills considers the second level of their formation with regard for the pedagogical specificity of study of the educational material: ability to determine the goals of study of a certain educational material (determination if a concept, theorems etc.); ability to make a logical-didactic analysis of the educational material on the basis of the goal to be set (point out the nuclear material, main ideas of the theme, to typify mathematical tasks etc.); ability to set clearly educational objective and select appropriate educational activities and operations; ability to organize activity of students and manage it in the process of solution of educational task (examples of question set, selection of means for solution of the educational task, set up of organizing and managing questions and variants of the same question, ways of reaction to an answer, etc.); ability to make up a calendar plan of the theme on the basis of its logical-didactic analysis; ability to analyze a lesson with regards for its goals and a teaching material; ability to analyze student's answer, to estimate it; ability to summarize and review articles (teaching aids) of the didactic, pedagogical and psychological contents; ability to make up a card for a report, for study of a certain theme.

The third group of the methodical skills synthesizes all previously formed skills and is realized on any educational material: ability to make a logical-didactic analysis of the school handbook as well as analysis of realization in the handbooks of a certain mathematical idea, line; ability to determine a hierarchy of the goals of teaching a certain theme, course, subject and to construct a system of its realization; ability to make up variable methods of teaching depending on the goals and real conditions of teaching.

To form the upper-called skills there is needed a system of theoretical and practical training. It is provided through a cycle of methodical subjects.

References:

1. Davidov V.V. Problems of developing training. – M: Pedagogics, 1986.
2. Davidov V.V. New approach to understanding of structure and the content of activity // The Psychological Magazine. 1998 . T. 19 . No. 6. Pages of 202-207.
3. Episheva O.B. Formation of technological abilities of the teacher as problem of reforming of education// All-Russian scientific conference “54th Gertsensovsky readings”. SPb. : RGPU publishing house of A.I.Gertsen, 2001.
4. Oganesyanyan V.A. etc. Technique mathematics teaching at high school. General technique. – M: Education, 1980.
5. Dudareva N.V. Formation of initial methodical abilities of students of teacher training Universities in the course of training in the solution of tasks on construction. Yekaterinburg, 2003.
6. Chikunova O.N. Formation of methodical abilities in the course of work on a task in courses of mathematical disciplines teacher training University / Dis. ... edging ped. sciences. Yekaterinburg, 1998.



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