Forming future teachers' readiness for the development of the schoolchildren's mathematical abilities

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The article considers the topical question of the development of the mathematical abilities; the author presents results of the empirical study which was dedicated in pedagogical University to establish contents and conditions of the forming of readiness to develop pupils' mathematical skills.

Key words: *the actual mathematical abilities, readiness of the teacher to develop mathematical abilities of the schoolchildren, value and motivation, content and activity, personal and individual components of the future teachers' readiness.*

The necessity to develop pupils' mathematical abilities is dictated by the reorientation of the mathematical contents of the school education, not only in the classes with profound studies but at all types of schools. The modern system of the mathematical education is not only oriented to give pupils mathematical knowledge but to develop their mathematical skills. The main target of this task is the children with well-developed intellectual abilities. The timely revealing of their potentialities and children's possibilities, the formation of abilities on their bases, including mathematical ones, acquire a particular significance.

The object of the research was the system of the professional training of the teacher of the mathematics in the pedagogical University, and his subject – the process of the future teacher's readiness for the development of the schoolchildren's mathematical abilities.

In correspondence with the object and subject of our research we have examined the contents and conditions of the students' readiness to develop pupils' mathematical abilities.

In the course of the research we made two operating hypotheses**.** The first is connected to the assumption that the readiness of the teacher to the development of pupils' mathematical skills – this is an integral personality phenomenon, representing professional need and the possibility to create conditions, leading to successful and dynamic changes in individual features of the personality while learning mathematics. The second hypothesis consists in the fact that the pedagogical students' readiness to develop mathematical abilities of schoolchildren will be formed successfully under the following conditions:

- Introduction into the educational process the system, spreading all over contents of the object, psychological and pedagogical, special training of the students, including as basic subjects, determined by the state standard, as well as eclectic, realized through special courses, the work of problem groups;
- While functioning of the system of the professional training using the principles of humanization, differentiation and integration;

– Realization, while teacher's training, personality-oriented, dialogical and individual and creative approach.

In the course of our research it was established a list of the most actual mathematical abilities. It includes: the perception of the mathematical material; the quick and large integration of the mathematical objects , relations, actions; reducing of the process of the mathematical reasoning and system of the corresponding actions; the flexibility of the thinking processes in the mathematical activity; quick and free reorientation of the thinking process, switching from the direct to reverse motion; clearness, simplicity, economical operations, rationality of decisions; mathematical memory; learning of the methods of the logic thinking; space representations and space imagination; geometrical intuition; making of the mathematical problems; solving of unstandardized tasks.

The readiness of the teacher to develop mathematical abilities of schoolchildren is the integral personal phenomenon which represents the professional need and the ability to create conditions, leading for success and dynamic changes of the individual pupils' features while learning mathematics.

We start with the mathematical teacher's activity, pupils' structure of the mathematical abilities, teacher's readiness for the development of the mathematical abilities is considered as the combination of the following interrelated components:

– Value and motivation, including the interest towards the problem of the schoolchild's personality development, the attitude to the development of his mathematical abilities, positive attitude to the pedagogical activity and the desire for the professional growth;
– Content and action, which is reduced to the necessary professional knowledge and skills which must be assimilated by the future teacher;
– Personal and individual, including professional and personal qualities, which are necessary for successful pedagogical activity to develop children's mathematical abilities.

While teacher's training dedicated to the development of the mathematical skills, it was necessary to clearly realize axiological aspects of the pedagogical activity, to acquire personality-oriented technologies of learning, in order to realize cultural, dialogical, individual and creative approaches, which was reflected in the experimental work.

The main conditions of the students' readiness forming to the development of the schoolchildren's mathematical abilities are represented by the following blocks: theoretical (the special course «Development of the schoolchildren's mathematical abilities»); practical (the work of the problem group and creative workshop); personality- oriented (individual work with the student, writing of undergraduate's thesis, graduation work, teacher's personality and etc).

During the experimental work we observed the development of the value and motivation, content and action, personal and individual components of their readiness.

Professional readiness of the future teachers of the mathematics suggests acquiring of professional knowledge at the methodological, theoretical, as well as methodic

and technological levels, it will require the knowledge of the general theory of the education – didactics, general and age psychology, but also special psychological and pedagogical knowledge in the field of the development of the mathematical skills, particularities of teaching mathematics to talented children.

The complete list of the necessary knowledge is represented in the created model of the teacher, oriented to the development of the pupils' mathematical skills. It includes value and motivation, personal and motivational, personal and individual, and content and action components.

The main group of pedagogical skills, necessary for realization of the teacher's developing function, in our opinion, is the following: informational, skills of the goal orientation and planning, organizational and communicative and reflexive skills, the skills of moral and will self-regulation, pedagogical techniques, applied and creative skills.

In the course of the research it was found, that the growth of value and motivation, content and action components of the readiness of the future teachers to develop pupils' mathematical skills are the bases and conditions of the development of the professionally significant personal qualities, determining the system of relations between the teacher and the pupil, attitude to himself and to his profession. We'd like to underline that the professional and personal qualities are deep psychological phenomena of the professional, which are created in the activity and require a long time, comparing with the other components of the readiness. Their demonstration is connected to gradual quantitative changes, happening with value and motivation and content and activity spheres, and also in transformation of these changes into qualitative personal and individual professional features.

Realization of the personal and activity approach in the professional training of students suggests:

- subject position of the student in the educational process of the pedagogical University;
- taking into account leading factors, determining general and professional development of students, types of their activity;
- creation of conditions for self-realizing of students' abilities, for their professional self-determination;
- use of the possibilities of realizing students' potential at different stages of the future teacher's personality development.

The elaborated system of the future teacher's training includes pedagogical, psychological, subject, methodical and special training, which are represented by the corresponding forms and methods of work with students. The principles, determining functioning and efficiency of this system are humanization, integration and differentiation.

The analysis of the existing psychological and pedagogical, methodic disciplines, taught at the physics and mathematics faculty, testifies, that they do not isolate the specific professional knowledge and skills, which are the core of pedagogical activity

of developing mathematical abilities. The most of the teachers, according to our data, are not ready for this activity. We suppose, that it is obligatory to define the circle of professional knowledge and skills, which are together with personal and professional teacher's qualities will provide the readiness for the development of the pupils' mathematical skills. The carried out research allowed us to make the analysis of the problem of the mathematical abilities and pupils' talents at the contemporary stage of the development of psychological and pedagogical; to find out axiological bases of forming the readiness for the development of the mathematical abilities; to determine contents and structure of the teacher's readiness for the development of the schoolchildren's mathematical abilities; to create the system and determine the conditions of its creation in pedagogical University.

In the process of research we approved: the program of the special course "Development of the schoolchildren's abilities"; the contents of the work of the problem groups and organizational bases for functioning of creative workshops; methods of studying of students training for the development of pupils' mathematical abilities; methodic recommendations for teachers of the mathematics for the development of the pupils' mathematical abilities in the conditions of the contemporary school.

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