

# THE POSITION OF DIDACTICS OF MATHEMATICS IN THE TRAINING OF MATHEMATICS TEACHERS

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We live in a time which prefers active people who are able to exist in a world full of conflicts and to be capable of solving complicated problems. The school carries a part of the responsibility for educating such individuals.

Currently our teachers are no longer working in the restricted conditions of a unified school curricula. Officially they have the opportunity to apply their creativity to their teaching. But the conditioning over several years, which has produced the stereotypical teachers survives and therefore the transformation of Czech educational system proceeds rather slowly.

A fundamental change in the conception of our schools' work is needed. This change is a transition from the "glasshouse" environment (where the student lives in two nearly separated worlds - in the school in out of it) to creating such a school climate that does not separate the student from his/her environment or experiences outside school. This transition is not accomplished without difficulties and is not performed generally but often only locally and in an uncoordinated way. To achieve the transition, it is not sufficient to change pedagogical documents alone, but it is necessary to prepare teachers for these changes in both, undergraduate and in-service courses. In this article we will concentrate on undergraduate teacher training (in-service training is not institutionally anchored yet), even though we are aware that undergraduate and in-service training cannot be separated. The quality of the undergraduate teacher training is the base for establishing a teachers' interest in professional development through in-service education.

During the period when students are trained for their future role in the teaching profession they are bombarded with an enormous number of different impulses. The amount and intensity of information students are facing, keeps growing. At present, the main difficulty is not the accessibility of this knowledge, but the shear amount. The only generally recognised goal of our schools now-a-days is to hand over to pupils/students as much information as possible preferably in the form of schematically ordered knowledge. Theoretically this goal should lose its position. But the school reality is different. It is much simpler and more easily measurable for a teacher to teach students (including future teachers) skills and knowledge without understanding than to teach them with understanding, the ability to use their knowledge and to be independent and self-confident. Very few people pose the question of how do we develop individuals who are able to meet these new conditions.

I believe that in order to produce **creative and self-confident students**, it is necessary to **firstly produce creative and self-confident teachers**. That is teachers who are capable, not only of delivering complete knowledge and procedures, but those who will develop pupils'/students' ability to use their knowledge and to react in appropriate and adequate way to changing conditions in the world around them.

A good teacher should be well prepared:

- not only **to teach**, but first and foremost **to help form** the pupils'/students' personality and attitudes,
- not only **to state** that the pupil/student is capable of learning something, but also **to change** his/her relationship to education and life.

**All the indications are that the present conception of undergraduate training influences the nature of the individual's interpretation of the teaching profession very little. Therefore it is necessary to search for such a form of teacher**

training whose content and methodologies would not only act on the student teacher's cognitive part of their personality, but much considerably influence their attitudes, value orientation, emotions.

At the same time it is imperative to teach future teachers to:

- **respect the student's personality,**
- **form positive attitude towards people and the world,**
- **support the committed child's approach to the cognition,**
- **connect the work in school to real life experiences.**

World-wide discussions about permanent changes of the quality of the undergraduate teacher training show unambiguously that these changes cannot be performed only by a change of teacher training content but also that the teacher training process and the climate in which it is done must be changed.

The undergraduate training of mathematics teachers is still often based on traditional methods and forms of work, especially on **formal receptive teaching and authoritative style of education**. This is caused, apart from other things, by the nature of mathematics as a scientific discipline, which deals with idealised objects, is based on complete argumentation and is constructed axiomatically. Such a comprehension of mathematics reflected in a school syllabus, cannot reflect sufficiently the real mathematical educational situations in everyday school practice. A teacher starting his/her professional life often does not fulfil their headmasters' and colleagues' expectations to bring **didactical innovations** into the school. It can happen that new teachers restrict the teaching to a simple delivery of contents fixed in teaching curricula and textbooks, and that they support the **development of their pupils'/students' creative abilities** very little or not at all. The development of this creativity is part the teacher's professional work but it is strongly influenced by the way how the future teacher was taught at primary and secondary schools. Most of them were probably taught by traditional methods in school. Therefore we consider it necessary to influence their attitudes and range of teaching methods during their teacher training period. This is the only way to break the **vicious circle**, of the new teaching in the way in which they were taught, where the most of the teaching is learning by rote through formal teaching methods.

We have a wide experience of teacher training and the analysis of results of all types of testing in the teaching training of future junior and upper secondary schools teachers at the Faculty of Education of Charles University in Prague (shortened to initial teacher education [ITE]). This experience together with interviews with students - future teachers, school teachers as well as the opinions of expert and non-expert people signal that in spite of all the efforts and innovations, the following important defects in the teacher training survive:

- **isolation of the subject and pedagogical-psychological components of teacher training,**
- **isolation of individual subject disciplines,**
- **insufficient orientation towards the teacher profession,**
- **imbalance between the theoretical and practical components of the course.**

The following schema shows the plan and relationships of the undergraduate training of future mathematics teachers in the Faculty of Education of Charles University.