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Problems and results of Didactique of Mathematics

Resumen

The teaching of mathematics is a social project whose aim is to have a selected student or institution learn an established or developing mathematical knowledge.

1. The scientific theorization of different aspects of this project is necessary for education and its management by society.

2. The teaching of mathematics requires activities irreducibly mathematical activities. No conjunction of classical discipline suffices to explain the functioning of this irreducibly mathematical part of mathematics teaching. A specific theory is necessary to bring over the results of other disciplines into the decisions of mathematics teaching.

3. Scientific theorization of these activities is possible. The "Didactique of mathematics" is the science of the conditions that are specific of the imposed broadcasting mathematical knowledge deemed for people and their institutions

4. The scientific approach of the irreducibly mathematical part of the teaching of mathematics (the "Didactique of mathematics"), is and will be the task mainly of the mathematical community.

5. A modification of our understanding of mathematical knowledge is necessary.

"We are not trying to meet some abstract production quota of definitions theorems and proofs. The measure of our success is whether what we do enables people to understand and think more clearly and effectively about mathematics." W. P. THURSTON

The activity of mathematicians is not restricted to the production of definitions, conjectures, theorems and proofs. It includes also the communication of results, the reorganisation of theories and knowledge, the formulation of questions and problems, and all that "enables people to understand mathematics".

According today knowledge and understanding, this other mathematical activity can neither be acknowledged nor integrated into mathematics.

6. The integration of the activities of mathematicians into the field of mathematics would require a development of conceptions and the extension of the "definition,speculation,theorem,proof" model, but this development is indispensable for the growth and improvement of the mathematical work itself.

The whole mathematical community faces a challenge.

7. Although in a very modest and simplified manner, the didactique has to model these activities in order to cause them to happen in other. As a consequence, the didactique appears as a means to identify these activities and to transform them into scientific knowledge.

8. In this new frame of reference, the didactique of mathematics will become an integral part of mathematics.

9. The research in mathematic education will consist of three absolutely necessary parts

- The research in mathematics teaching stemming from the application of methods or concepts from other disciplines (psychology, sociology, linguistic, pedagogy, etc. in particular the application of general education) and/or those that are not specific to mathematics

- The didactique of mathematics that tends to point to and explain the teaching phenomena specific to mathematics and that allows to apply the results of other disciplines.

- The didactic ingeneering that tends to produce the means and teaching materials based more or less on the didactique and other disciplines.

10. Its necessary to determine what the results in M.E. are for, how they are arrived at and established, and at the same time which institutions are responsible for the production and possible modification of these results and which institutions will use them.

11. Efforts should be pursued to support a community of researchers interested in discussing these very issues with plausible arguments.

12. The relations with educational institutions should be the object of important methodological and ethical review. In particular the mixing up or confusion between the research on teaching and the activities of teaching can be a subject of criticism.