

Introducing a historical perspective into the teaching of mathematics.

The situation in Germany

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Apart from singular exceptions, depending on special inclinations of sole teachers, there are usually no explicit historical items in the mathematics classroom of today in Germany

The most used textbooks for secondary schools ("Mathematik heute", Hahn/Dzewas, Lambacher/Schweizer, Kusch/Aits) generally do not mention historical facts. Some very few exceptions are eclectically scattered like curiosities over the optional exercises or introductions. In such cases there is no attempt to explain historical or social perspectives, language and expressions are modernized without any comment, and there is no connection between the examples showing any emergence of ideas. The historically most detailed example is in Hahn/Dzewas, Vol. 10, p. 87. Their section "applications of π " opens with five short sentences about disagreements concerning the shape of the earth and Eratosthenes' opinion. Having explained the geometrical design of his measurement the historical digression ends with the suggestion to compute the earth radius from the equation

$$900 \text{ km} = \frac{\pi * r * \text{angle measured}}{180^\circ}$$

as if Eratosthenes had done this.

Most of the newer textbooks for secondary schools up to the 10th grade (Büning/Spallek, Kuypers/Lauter/Wuttke, Tischel) concentrate on applications and leave the historical aspects at the level just mentioned. The only exception, as far as I see, is Barth/Federle/Haller of Bavaria who try (since 1985) to strengthen historical aspects of Algebra and Geometry using historical pictures, comments, and some exercises to illustrate the fundamental ideas. But the sequence of books is rather expensive and concerning the exercises the historical perspective is optional. At the 'Oberstufe' (grades 11 to 13) there are only two rather singular books using historical items to introduce and to illustrate the fundamental concepts: a textbook of Danckwerts on Analysis and one of Barth/Haller on Probability. The first one is not very common, and the second one is too big, too expensive, and too far from Statistics for practical use in the classroom. In general the used textbooks show the same lack of historical aspects as mentioned above with respect to the books for lower classes.

It is impossible to understand or discuss the German standard curricula in mathematics on a large scale without historical perspective.

Mathematics is presented to the pupils as a sequence of concepts and constructions of continuously rising complexity. Secondary school teachers in mathematics are convinced of a general principle that allows them to identify hypothetically logical and psychological difficulties in the classroom, namely that higher items have always to be understood as a simple consequence of lower facts, skills and methods. Being successful in mathematics means to the ordinary student to remember approximately all the details from the former lessons and to make no mistake in applying them.

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