

# SHOULD A COURSE ON HISTORY OF MATHEMATICS DEVELOP TEACHING COMPETENCE?

**Examined through a study of history of mathematics courses at  
Danish universities and interviews with teachers in the upper secondary school.**

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Summary Description: The Danish regulation for teaching mathematics in the upper secondary school (Danish 'gymnasium') from 2007 requires that history of mathematics is included in the curriculum. In the regulation it is stated that the students should be taught a module in history of mathematics. The idea of including history of mathematics was not entirely new in 2007. Already in 1987 it was stated in the regulations that teaching in mathematics should contain a *dimension* of history, but not that it should be treated in an actual module. Until 2007 it seems that the teachers in mathematics had been able to handle the inclusion of history of mathematics as a part of their ordinary teaching, so history of mathematics may have been largely neglected.

To require teaching in history of mathematics calls for competent teachers, who have an understanding of the essence of history of mathematics. Although it is not made explicit what the intended outcome of the student's knowledge should be after being exposed to history of mathematics, one aim is to give the students an understanding of mathematics as a science which is changing over time. If intended outcomes are not made explicit it is difficult to say what a 'competent teacher' is.

I intend to analyze arguments for the inclusion of history of mathematics in teaching discussed in the current literature. Through this I want to examine which motives could have contributed to the request of inclusion of history of mathematics in 2007. Furthermore such a study could point to possible ways of including history that could be beneficiary for students learning mathematics. In the literature are several arguments for and against inclusion of history of mathematics in teaching. Kjeldsen and Blomhøj (2011) propose that history plays a crucial and perhaps even irreplaceable role in teaching and learning of mathematics. This is based on a view of learning mathematics through learning meta-discursive rules (Sfard 2009). Siu (2004) lists sixteen unfavourable factors on inclusion of history of mathematics. In this list, Siu points out that the students find history of mathematics boring, and that inclusion does not contribute to an improvement of the student's grade.

Another issue concerns the teachers' attitude towards history of mathematics. Jankvist (2008) writes: "*Studies suggest that teachers often is reluctant to include history of mathematics in teaching. This is for example due to the fact that teachers do not feel equipped to include history of mathematics,*"(p. 26, my translation from Danish)

Therefore it is relevant to examine how teachers are educated in order to handle the requirement of teaching modules in history of mathematics. I intend to perform a study of courses on History of Mathematics at the Danish universities, to examine whether these courses equip future teachers to be able to handle the requirements on history of mathematics in their teaching. This study will in particular focus on whether the courses contribute to the development of student's teaching competence, and to which degree courses are designed on this basis.

In addition I wish to examine Jankvist's claim that teachers feel ill-equipped to include history of mathematics. Do teachers really feel incompetent to teach history of mathematics? If so, what can be done so that they feel competent? Jankvist (2008) writes that "*the teachers should function as a communicator of history of mathematics in the same way as they already are of mathematics*" (p. 42, my translation from Danish). This indicates that it might only be a change of attitude among teachers which is needed before they feel equipped to include history of mathematics in their teaching. I will conduct interviews with teachers in the upper secondary school, in order to discuss the following questions:

- Do teachers in the upper secondary school feel ill-equipped to teach a module in history of mathematics? If yes, in what way.
- If they do, do they have suggestions to what can be done to make them able to implement a module on history of mathematics in their teaching?

Further I will examine whether it is illustrated in the curricula what is required in connection with the teaching in history of mathematics in the upper secondary school. The above primarily empirical material, and my analysis of this, will be presented on my poster. In addition my analysis of the arguments for and against use of history of mathematics in upper secondary school will be displayed. I will further try to draw some connections between the three issues which my thesis, as outlined above, will focus on. The three issues can be summed up in the following three keywords: Arguments for inclusion, What is teaching competence and How do we get competent teachers.

#### References:

Jankvist, U. T. (2008). Den matematikhistoriske dimension i undervisning – gymnasialt set, *I: MONA: Matematik og Naturfagsdidaktik*, Vol. 4, Nr. 1, s. 24-45.

Kjeldsen, T. H. & Blomhøj, M. (2012). Beyond Motivation: History as a method for learning meta-discursive rules in mathematics. *I: Educational Studies in Mathematics*, Vol. 80, NR. 3, s. 327-349.

Sfard, A. (2009). *Thinking as communicating*. Cambridge University Press.

Siu, M.-K. (2004). No, I don't use history of mathematics in my class. Why? I: F. Furinghetti, S. Kaijser & C. Tzanakis (red.), *Proceedings HPM2004 & ESU4* (s. 268-277). Uppsala Universitet, revised edition.