CERME6
Working Group 15
Theory and research on the role of history in mathematics education

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In this working group, which was active for the first time in CERME 6, 23 papers were submitted. Four of them were rejected; four were accepted as a poster. In the end three of the accepter posters and one of the accepted papers were withdrawn. So in Lyon, 13 papers and one poster were presented.

If one takes into account that the working group has no tradition in CERME, and that those who submit and those who review have to find out what are the criteria for sound research about "Theory and research on the role of History in Mathematics Education", then the percentage of rejections is reasonable.

Especially the demarcation of the subject area was not always clear for the researchers who submitted. In one case, which extended to a whole series of papers, the joint chairs of the working group decided that the subject area should be defined in such a manner that these papers could be included, provided that they would have sufficient quality. Yet, originally, the subject area was described by the joint chairs in a narrower manner. The papers meant in this remark concern the history **of** mathematics education.

One could argue that these papers are about history and that their content may influence mathematics education, in the sense that the awareness about the nature of mathematics and its role in education that may be brought in by a study of issues of the history of mathematics education is important for pre- and in-service teacher education. Yet, this was not the manner in which the joint chairs had originally described "the role of history in mathematics education". The original idea was to assemble in the working group those colleagues who research the effects that integration of historical elements (problems, texts) in current mathematics education may have. The subdivision of the main theme in seven topics was clear in this respect, as may be seen from the list:

1. Theoretical and/or conceptual frameworks for including history in mathematics education
2. The role of history of mathematics at primary and secondary level, both from the cognitive and affective points of view
3. The role of history of mathematics in pre- and in-service teacher education, both from the cognitive, pedagogical, and affective points of view
4. Possible parallelism between the historical development and the cognitive development of mathematical ideas

5. Ways of integrating original sources in classrooms, and their educational effects, preferably with conclusions based on classroom experiments
6. Surveys on the existing uses of history in curriculum, textbooks, and/or classrooms in primary, secondary, and university levels
7. Design and/or assessment of teaching/learning materials on the history of mathematics

This is not aiming at having papers about the history of mathematics education. This means to work with students in current mathematics lessons and to find out how they respond to the historical elements in these lessons. Nevertheless, after some deliberation and also because some interesting papers were submitted, the joint chairs decided to add a new topic 8 to the above list

8. Relevance of the history of mathematical practices in the research of mathematics education

and to review submissions in this area. In the preparations for CERME 7 it should be decided and clearly stated whether this topic 8 (briefly described as "the history of mathematics education") should be included or excluded from the programme.

Looking back on the proceedings of the working group during CERME6, we may conclude that there were two main streams of papers, one about the original theme of integration of history in current teaching (subtopics 1 to 7), and the other about how mathematics was taught in the past (subtopic 8). The two went together in a fairly harmonious manner.

The papers and the subtopics on which they focused are summarized in Table 1; the numbers refer to the above list of subtopics.

Ba & Dorier	1, 2, 8	Lawrence	2, 3, 5
Bjarnadóttir	8	Menghini	8
Blanco & Ginovart	5, 7	Milevicich & Lois (poster)	1, 4
Da Costa	8	Novaes & Pinto	8
Demattè & Furinghetti	2, 7	Rogers	3, 6
Jankvist	1, 2, 6	Tardy & Durand-Guerrier	1, 3, 7
Hoff-Kjeldsen	1, 2, 5	Thomaidis &Tzanakis	5, 6

Table 1. Main focus of the papers according to the 8 topics listed above

As to the working procedures, the time available for each paper was 45 minutes, which was equally divided between time for presentation and time for discussion. The discussions proceeded in a pointed and engaged manner, with input in the respective aspects of the working group: research methodology, historical references, educational and mathematical points.

In the evaluation one important observation was made about the relation of this working group with another group which is active in the intersection of mathematics

education and the history of mathematics, which is the affiliated study group of ICMI about the relations between the **H**istory and **P**edagogy of **M**athematics (HPM). We observed that HPM has contributions of more varied character. In this WG 15 we tried to work with a specific methodology (or maybe two methodologies: an educational research method - often influenced by historical research and methodology - for subtopics 1 to 7 and an historical methodology for subtopic 8), which as one of its elements includes a theoretical framework, in which the relevant literature is discussed.

Finally we propose for CERME7 to include this working group again, and to then name it:

"Historical dimensions and mathematics education: theory and practice

so as to include all 8 subtopics of the current working group 15.

List of papers and posters

TITLES	AUTHORS
The teaching of vectors in mathematics and physics in France during the 20th century	-Ba, Cissé -Dorier, Jean-Luc
Geometry teaching in Iceland in the late 1800s and the van Hiele theory	-Bjarnadóttir, Kristín
Introducing the normal distribution by following a teaching approach inspired by history: an example for classroom implementation in engineering education	-Blanco, Mónica -Ginovart, Marta
Arithmetic in primary school in Brazil: end of the nineteenth century	- Da Costa David, Antonio
Historical pictures for acting on the view of mathematics	-Dematte Adriano -Furinghetti Fulvia
Students' beliefs about the evolution and development of mathematics	- Jankvist, Uffe Thomas
Using history as a means for the learning of mathematics without losing sight of history: the case of differential equations	-Kjeldsen, Tinne Hoff
What works in the classroom - project on the history of mathematics and the collaborative teaching practice	-Lawrence, Snezana
Intuitive geometry in early 1900s Italian middle school	Menghini, Marta
The historical and cognitive development of calculus ideas	-Milevicich, Liliana -Lois, Alejandro
The appropriation of the New Math on the Technical Federal School of Parana in 1960 and 1970 decades	-Novaes, Bárbara Winiarski Diesel -Pinto, Neuza Bertoni
History, heritage, and the UK mathematics classroom	-Rogers, Leo
Introduction of an historical and anthropological perspective in mathematics: an example in secondary school in France	-Tardy, Claire -Durand-Guerrier, Vivienne
The implementation of the history of mathematics in the new curriculum and textbooks in Greek secondary education	-Thomaidis Yannis -Tzanakis Constantinos