

CHANGING TEACHERS' IMAGES OF MATHEMATICS AND MATHEMATICS TEACHING

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Teachers' conceptions have a powerful impact on teaching through such processes as the selection of content and emphasis, styles of teaching, and modes of learning (Ernest, 1989). Green(1971) emphasized not only the content of a person's beliefs, but also the way he holds them. History could offer situations to challenge teachers' conceptions about mathematics and mathematics teaching (Fruringhetti, 2007). However, most studies were conducted with pre-service teachers.

This research project aims to examine the influence of history of mathematics on in-service teachers' conceptions about mathematics and mathematics teaching. The research questions are: 0) Are there any changes in the teachers' conception about mathematics as a discipline? If so: 1) What are these changes? 2) Are there changes in the way the teachers hold their beliefs? If so, which? 3) To what extent, if any, do these changes seem to influence the teachers' conceptions about their mathematics teaching?

The sample comprises 50 in-service lower secondary school teachers. They read, discuss and reflect the history and pedagogy of 9 topics online for one year. Data for the pre-post-test comparison was collected by identical 6-point Likert questionnaire and open-ended questionnaire. Reflection tasks were also collected during the project, as well as the follow-up interview. Two teachers are followed as individual cases.

The quantitative data indicates that there are significant changes in teachers' conceptions. Teachers tend to agree more with the problem-solving view (from 4.71 to 5.13) and less with the instrumentalist (from 4.11 to 3.61) and Platonist view (from 3.99 to 3.65). For teacher Hu, some of his conceptions about the application, the evolution and the nature of mathematics changed, while something new are added. His conceptions about mathematics as a discipline are supported by more examples, more justified, more consistent. Some unconscious beliefs becomes more conscious. From the change of both the content of beliefs/views and the way they are hold, we can know that teacher Hu' conceptions about mathematics as a discipline are more close to some aspects of Ernest's Platonist view and Problem-solving view, far away from the Instrumentalist view and some other aspects of Ernest's Platonist view. Teacher Hu' conceptions about the mathematics teaching are more close to content-focused with an emphasis on conceptual understanding view and learner-focused view. In the presentation, further results will be discussed in detail.

References

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