



DISSEMINATING INQUIRY-BASED SCIENCE
AND MATHEMATICS EDUCATION IN EUROPE

Deepening the Specificities of Scientific Inquiry in Mathematics

*Report on the workshop at the Fibonacci Conference
at the University of Bayreuth on 21 September 2010*

At the Fibonacci Conference at the University of Bayreuth on 21/22 September 2010 a workshop focused on the topic “Deepening the Specificities of Scientific Inquiry in Mathematics”.

In the first part Prof. Dr. Kenneth Ruthven (University of Cambridge) talked about “The dialogic bases of effective inquiry-based education”. He pointed out that current theories of education link a constructivist position to the social dimension of teaching and learning. In educational processes language and dialogues play crucial roles. From this point of view learning can be seen as an appropriation of social languages. Studying mathematics and sciences requires learners to reconstruct the sense of a talk – reorganizing their already existing ideas and their individual ways of thinking.

Since students already have an individual language, Kenneth Ruthven suggested a concept of *dialogic teaching*. Here, oral classroom communication – in small groups or in the whole class – is the core element of teaching and learning. In the workshop Peter Gallin (University of Zurich) added that written dialogues between students and teachers in study diaries can have similar or even deeper effects.

Finally, Kenneth Ruthven presented a current teacher education offer in Great Britain, where teachers are made acquainted with the concept of dialogic teaching and where they work with their classes in a dialogic way.

In the second part of the workshop Prof. Dr. Petar Kenderov (Bulgarian Academy of Sciences) talked about “Inquiry-based learning in mathematical competitions for students”. He pointed out that current mathematical competitions for students – like the International Mathematical Olympiad – are useful in the educational system and have positive effects to some extent. However, they require a very specific kind of thinking which is substantially different from scientific inquiry.

Thus, he proposed a new kind of competition for mathematically interested and gifted students – a concept that has already been applied in Bulgaria for about ten years. Students are given a mathematical topic. They explore it for several weeks according to the concept of inquiry-based learning. Finally, the students produce a report on their results and they are invited to give a presentation.

Currently, in Bulgaria about 100 students per year take part in this offer. They explore mathematics like a scientist in a very inquiry-based manner. The best ones are invited to take part in a mathematics course in the USA for six weeks.

This offer seems to be transferable to other countries and may be a way of fostering mathematically interested and gifted students all over Europe.

Volker Ulm