

A MATHEMATICS PROJECT REALISED IN A NON FORMAL ENVIRONMENT: LEARNING AS A SOCIAL EVENT

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It usually happens at high school level that during a classroom lesson, teacher – student contacts are formally structured: the teacher has to find a good motivation, an efficient strategy and has to be a mediator between knowledge and pupils. In order to trial another context of learning, during the last school year, the author participated, as teacher of a first-year class of a Scientific Lyceum (14-15 aged pupils, experimental course), in the meeting “*The mathematics of the boys/girls: exchange of experiences among boys/girls of the same age – IV edition*” [LEDER D. et al., 2002, 2003]¹, introducing a laboratory named “Mathematics on the river banks”. This meeting is biennially organised by the Didactic Research Group of the University of Trieste. It is addressed to primary and secondary school students and it is based on the didactical methodology of interaction between peers [PONTECORVO C., 1991]² and co-operative learning [COMOGLIO M., 1996]³.

In our laboratory, the students had to explain some topics of the Egyptian and the Babylonian Mathematics to other pupils, including primary school children.

In this poster, the author analyses the project (methodology, steps, aims) and the experience (in preparatory stage, during the meeting and after the meeting) from different points of view, on the basis of direct observation and data collected by various questionnaires.

1. Emotional and relational aspects:

- In an informal environment, capacities and abilities emerge that students do not usually show (A., a student who usually doesn’t participate actively during the lessons, showed good organising qualities and spirit of enterprise).
- During the working group, they supported each other, listened to other suggestions and ideas, took initiatives: they created a positive climate in the

¹ LEDER D., SCHERIANI C., ZUCCHERI L., 2002, *The mathematics of the boys/girls: exchange of experience among boys/girls of the same age*, Poster, in *Proceedings of CERME2*, Mariánské Lázně, Czech Republic

LEDER D., SCHERIANI C., ZUCCHERI L., (editors), 2003, *Antologia della “Matematica dei ragazzi – Scambi di esperienze tra coetanei”*, edizioni 1996 – 1998, ed. Università di Trieste

² PONTECORVO C., AJELLO A.M., ZUCCHERMAGLIO C., 1991, *Discutendo s’impara: interazione sociale e conoscenza a scuola*, ed. NIS, Roma

³ COMOGLIO M., CARDOSO M.A., 1996, *Insegnare e apprendere in gruppo: il cooperative learning*, ed. LAS, Roma

classroom. But, there was also some difficulties: for example, there were some pupils that was unable to work in a collective way, or someone else (*J.*, a very good student) that did not work enough because this project did not produce a mark.

- All the pupils, before the meeting, were worried about speaking in public. They were conscious that would be necessary use simple words and that they will be completely alone in the management of the matter (*C.P.* did not participate in the preparatory stage and did not want to come to the meeting either, but during the meeting, she overcame this problem and actively helped younger participants in laboratory activities. A girl, *C.*, not an excellent student, who usually have some difficulties in communication related to Mathematics, liked very much explaining to primary school pupils and she found the way to make the pupils protagonists: she was very loved by them).
- Working together had made easier the concepts assimilation.
- The experience allowed the students to better know each other and to improve their relationship.

2. Aspects related to mathematical learning:

- Carrying out the project, the students realised that learning something in order to explain to someone else encourages better understanding and is more difficult than learning something for themselves.
- The allocation in a historical context gave them a new positive belief of Mathematics.

3. Difficulties emerged during these activities:

- The students were not use to working in an autonomous way, maybe because they came from previous experience in traditional school where the pupils had little space to express themselves.

4. Long term effects of this didactical experience:

- This experience has improved the pupil's' communication and organisation capacity to present *any* subject.
- 72,5% of pupils still remembered the main concepts related the Egyptian and Babylonian Mathematics after the summer holiday.