

**Report on teaching visit – Pisa, Italy – 16.2 –20.2.2009**

**Before the visit**

*1. IUFM: Working session on the project*

From mid-May to the end of January, 8 working sessions had been planned to prepare the visits.

The first sessions had been devoted to the reading of Italian mathematical textbooks, more particularly the topics of fractions and Pythagoras theorem. This work was realized with an Italian teacher and trainers.

The main thrust of work was obviously the Italian language but also the differences in approach to mathematics in Italian teaching, in particular on the topics of fractions (and the equality of some) as well as the of Pythagoras' theorem. The most important variations are:

- Set vision of mathematics in secondary school: the irreducible fraction is the smallest representative of all the fractions which are equal (involves notions of coset, representatives, congruence; concept of subsets...). We speak then about equivalent fractions (and not about equal fractions). We also find these aspects in geometry.
- Slightly different notations ( $\cdot$  for  $\times$ ,  $\overline{AB}$  for  $[AB]$ , ...)
- Vocabulary sometimes different.

The different approach to mathematics involves a different approach to the suggested topics.

As a visitor teacher, my aim trust of work was obviously the differences in approach to the mathematics but also the language, the mathematical language, and classroom language.

Learning Italian was an important work to carry out to these meetings. I make a point of specifying that I worked initially on the Italian language (via Harrap's method) and then focus on mathematical and classroom languages themselves (vocabulary, expression...).

Olivier and I prepared our first lesson and tested it during IUFM working sessions. The aim was to adjust our work and our language. I also tested this lesson (Gallicized one) with my own pupils.

The last session was devoted to prepare our week in Pisa.

*2. Visit to Lycée Leonardo da Vinci - Paris*

In parallel, Olivier and I had been visiting a mathematics teacher in the Italian secondary school of Paris. We attended three 2h sessions of a 2<sup>nd</sup> year class.

All the observations greatly helped us to impregnate ourselves of the way a lesson in Italian take place.

There were still great differences in approach:

- Material: the pupils only have at their disposal their textbook (which is their property) and a copybook. The lesson is never written, everything is in the book. The pupils are in autonomy to note the corrections of exercises, to take notes...
  - “Freedom” of the pupils: the pupils can, within the limit of reasonable, stand up, chat... but they participate.
  - Development of the session: the teacher entirely builds the lesson (there are not any autonomous activities). He stands all the time at the blackboard, possibly with a pupil (who can be the same one during the entire lesson. We did not see work in autonomy).
  - Homework: very important in volume. The answers to the exercises are in the book. It involves that all the exercises are not corrected, only one or two per type.
- I guess these observations were essential to prepare our visit. They completed our work sessions at the IUFM.

## The visit

### *1. Observation*

On Monday we arrived at the school and we observed classes for two half-days. We were well warmly received by Rossella Masi and by pupils. A characteristic of the Italian teachers in college is interdisciplinarity, in fact maths, physics, chemistry and biology. We thus attended lessons in these three subjects in the three levels of the secondary school.


The teaching methods were the same as those we had observed in the Italian secondary school of Paris, which reinforces the interest of these preliminary visits for the project.


### *2. Session 1: discovering equivalent fractions and invariant property*


The first lesson was planned for Wednesday morning. I had decided to mix the French methods and the Italian ones for the first lesson. I had thus prepared an activity in autonomy followed by its correction and exercises of application; the homework centred on the (re)comprehension of the subjects, on training (via their book) and on technical exercises of application.

This approach was decided for two main reasons:

- My own practice of teaching and conviction of the interest of this preliminary work.
- Help for the language: that enabled me to quietly start in the lesson without having barriers due to or lack of vocabulary, or to not understand questions or remarks of the pupils.

It all happened very well during the first part of the session. The pupils played the game and most of them worked alone  [Videoclip1](#). Some instructions did not seem clear to some of them. I think I would have the same percentage of pupils puzzled by the instructions in a French class. The colouring of the rectangles was sometimes clownish (and thus the vision of the same coloured forms was complicated) but this pitfall was avoided, having tested beforehand this activity with my own pupils and having undergone the same kind of artistic wills!

The correction unrolled also well. The use of a video projector presentation was decided first of all for a question of language: this support still enabled me to keep the hand and to have a linguistic arsenal planned for each slide. It was also (and especially) selected to show the superposition of the rectangles  [Videoclip2](#).

The great difficulty of the lesson (because there was one of it nevertheless!) appeared at the end of the correction: I asked them to explain why the property could not work with 0. I had thought enough about the explanation to give in Italian, nor of the reaction of some pupils. I did not speak about this particular case to my French pupils during the test). I was in difficulty to get it over because of the language and I had difficulty to understand the questions or remarks of some pupils  [Videoclip3](#).

I guess it was the only moment when the language was a barrier to the “transmission of knowledge”.

The end of the lesson was devoted to exercises of application in autonomy. The majority of the pupils quickly got down to work without showing difficulties.

I am overall satisfied with this lesson. I think I have managed to make myself comprehensible and to understand the pupils. Moreover, I felt at ease rather quickly. The fact I have already tested the lesson and lesson type explains this result: I knew where the mathematical difficulties were and I had prepared mathematical and language response to them.

Only flats: the question of the 0 and an essential question: at the end of the lesson which pupils did well understand? I didn't know what to think about it. I see two main factors (without being able to give relative importance...) that played on this impression:


- Obviously the language
- My lack of knowledge of the class (similar impression to that I feel per moment at the beginning of year when I discover my new pupils).

### *3. Session 2: fractions reduction*


Deriving strength from this first experiment, I arrived in another state of mind for the second lesson.

I decided to increase the proportion of Italian teaching method by being a little bit more the driver during the lesson.

The first part of the lesson was devoted to the correction of the exercises the pupils had to do.

We initially reconsidered the invariant property then I sent pupils to the blackboard to correct the exercises. Errors made by some pupils during the correction (clownish of the colouring, non-equal parts...)  [Videoclip4](#) were useful to recall the important points on the fractions and on the invariant property.

After that, I distributed an activity on the fractions reduction and various possible ways of reduction:

- Successive divisions  [Videoclip5](#).
- Decomposition in prime numbers.
- Greatest Common Divisor (GCD).

The pupils had difficulties during this activity and I had to take the hand sooner than expected, to build with them these methods of reduction.

I guess this event happened because of the pupil's document. Indeed this document was less well prepared than the day before. It is notable that the pupils' participation was less important than the day before.

The first method of reduction took place without too much difficulty, the pupil at the blackboard managed well. Nevertheless the second method of reduction was difficult. The knowledge of the power rules and the use of the invariant property were needed. The pupils and particularly the one who was at the blackboard had a lot of difficulties, in spite of my help and my guiding questions...

Reduction using the GCD proceeded without pitfall. We did not have time to continue with exercises of application. The lesson stopped at this point.

I am less satisfied by this lesson. The pupil's document was not sufficiently good to allow a chain of the lesson like the day before. I had initially considered another order in the methods of reduction and I wanted to finish with prime factors. It was not a good idea...

And beyond the problem of timing, the will to build these methods with the pupils proved to be difficult because of the language.