

# QUESTIONNAIRE FOR MATHEMATICS TEACHERS – ANALYSIS

## ITALY

The questionnaire was answered by 79 in-service lower secondary school teachers of mathematics (teaching 11-14 year old pupils), mainly from Tuscany Region. The majority (48%) of the schools are in towns and cities with more than 10.000 inhabitants, whereas 28% of the schools are in villages and towns with 1.001 to 5.000 inhabitants. Among the respondents there were teachers with very short teaching practice as well as very experienced practitioners (3 with 1-5 years of teaching practice; 17 with 6-10 years; 24 with 11-20 years; 35 with more than 20 years of teaching practice). All of them teach both mathematics and sciences, as in the Italian lower secondary schools the two subjects are taught by the same teacher.

Italy is a significantly multicultural country in comparison to some other European countries, with the percentage of foreigners increasingly growing in the two last decades. As to the education system, the number of foreign (i.e. with non-Italian citizenship) pupils in the Italian schools raised from about 307 000 (3.5% of the school population) in the 1993/94 school year to 756 000 (8.4%) in 2011/12. The figures and the percentages are even greater if all pupils with minority cultural background are considered.

The percentage of minority pupils in the respondents' schools is 13%, ranging from 1% to 65%.

In Italy, multicultural class is an actual, but also a varied phenomenon, due to its

- *geographical distribution*: foreign pupils mostly concentrate in Northern and Central Italian schools, only a small percentage being enrolled in Southern ones;
- *citizenship variety*: in a town or a region foreign pupils can represent a high number of citizenships (at present, about 200) with significantly different distribution of presences (about 141 000 from Romania, 103 000 from Albania, 96 000 from Morocco, 34 000 from China, ...);
- *flow change*: the presence of foreign pupils is a direct consequence of the migratory flows from different areas and countries, that is, in turn, caused by different and, sometimes, unpredictable events, such as job search, poverty, wars ...

*The Italian Way to Intercultural Education and the Integration of Foreign Pupils* white paper, issued (in the year 2007) by the Italian Ministry of Instruction, University and Research pursues the following objectives:

- highlight the circumstances, the choices and the actions distinctive to the Italian situation;
- identify the strengths which will lay the groundwork for the “system”;
- identify the weaknesses in order to develop new practices and resources;
- promote new objectives and projects.

Four main principles underlie the best practises developed when foreign students first accessed the Italian school system, the Italian education legislation approved by central government and actions taken at local level:

- a universal approach
- a common school
- the centrality of the person

– intercultural education.

Inclusive education is, therefore, the Italian pedagogical choice for the multicultural classes.

As also the answers to a questionnaire item clearly show for Mathematics, in Italy very little has been so far done, as far as subjects teaching is concerned. Only the teaching of the Italian language as a second language has been paid adequate attention: teacher training courses are being organised, and foreign pupils are provided with special assistance and extra classes for Italian language learning.

Only in the last decade, the initial secondary teacher training courses had a module on intercultural education under a pedagogical perspective. The questionnaire analysis showed that very few other training opportunities were made available (1 respondent refers to a two-years project held by an Albanian cultural mediator). Only 8 out of 79 teachers benefited from these opportunities.

The recent in-service training referred to by 4 respondents in the questionnaires were represented by the attendance to meetings and two training courses on mathematics education in multicultural classrooms.

Prior in-service training activities were mentioned by 11 teachers: seminars and conferences, refreshing courses organised by INDIRE (the Ministry of Education Institute for the Training and the Educational Research), Schools, Universities, Associations and Local Authorities. The impact of the training is variously referred to: the individual enrichment and position towards the different educational context is clearly and frequently outlined. A change in the way the lesson and the material (including the production of a textbook) are prepared and organised, are also mentioned by 4 respondents.

The large majority (72%) of the respondents' schools have an official programme to support minority pupils educational inclusion, whereas 61% of the teachers already experienced multicultural classrooms.

In particular, answers refer to intercultural boards and teachers in charge of multicultural issues, intercultural projects, linguistic laboratories (L1 and L2), and individually centred programming.

The educational context and the difficulties met by teachers (49%) were tackled in different ways:

- *looking for adequate materials* (25%) : books and papers, teaching units (by mathematics education researchers, math teacher training programmes by the Ministry and local entities), ICTs, vocabularies of symbols names, textbook,...
- *searching for collaboration from other teachers* (35%);
- *asking for support from the school management* (27%): L2 (curricular and extra-curricular) classes, intercultural board for the school inclusion, additional funds, cultural mediators, literacy courses, school facilities, additional teaching hours;
- *identifying advantages from the educational context* (37%):
  - *The teacher*

Professional development: identification of new didactic approaches and different cultural activities to be introduced in mathematics classes for the advantage of the whole class;

Change of attitude.

- *The pupil*  
Interpersonal relations and communication;  
Cultural enrichment;  
Inclusive behaviour;  
Overcoming prejudices and cultural barriers;  
Knowledge interchange.
- *Both teachers and pupils*  
Wider way of thinking and respect of different cultures.

Nevertheless, a few difficulties emerged from the analysis of the answers by the respondents:

Large number of pupils in the classroom impacts negatively on the socialization process;

Language related issues can slow the teaching activity;

Ordinary teaching hours are not sufficient to put into practice the necessary didactical changes;

Theory – Practice possible conflicts.

Respondents explicitly observe that most educative actions are based on personal research, as searching on web-sites for educative models or suggestions to teach foreign pupils (e.g. Educational 2.0,...) and participating in forum; studying relevant publications. They comment that, despite the large amount of materials available, only a small part had an adequate experimentation. Other respondents say to have experienced additional activities out of the class-group and peer-to-peer support to minority pupils by native class-mates with good communication skills.

Nearly half of the respondents (42%) claimed that a methodological change was necessary; in particular:

- *About language*  
Simple, clear and basic language;  
Small use of words and definitions, large use of icons, schemes, examples...;  
Slow speech, capital letters;  
Critical reading and rewriting of the textbooks;  
Smooth introduction of concepts and terminology;  
Etymology, history and translation of the mathematical terms.
- *About general methodology*  
Careful analysis of features of the class-group;  
Systematic control and interpretation of difficulties (due to the language understanding or to misconceptions/cognitive blanks);  
Individually centred teaching, even by using simplified work-sheets or summary forms;  
Group and workshop activities, cooperative learning, concepts mapping;  
Narrative methodology;  
Historical references;  
Greater care in topics selection and methodological choices (e.g. practical activities, use of structured material,... );

Knowledge socialization activity: valuing minority pupil's knowledge about a given topic, and identifying and discussing differences and similarities to the mainstream knowledge;

Introduction and comparison of arithmetic algorithms from different countries;  
Slowing teaching flow.

- *About assessment methods*

Choice of assessment methods relating results with actual individual possibilities;

Simplified classroom tasks.

The need for supporting pedagogical documents was identified by 59% of the teachers, information about the cultural backgrounds of minority groups by 71% and concrete didactic units from various cultural backgrounds by 66% of the respondents.

In addition, 37% of the teachers claimed to need also:

- Specific training courses and meetings for experiences sharing ;
- Reduced number of pupils in the classroom;
- Language support materials and L2 courses;
- ICTs;
- Textbooks:
  - easily readable and generally accessible
  - including a lot of images on fundamental disciplinary concepts
  - presenting daily life contextualized activities
  - bilingual
  - digital;
- Technical scientific dictionaries;
- Vocal translator software;
- Video-cameras.

Other requests concern:

- structures for the developing of basic abilities in Italian language and mathematics to be attended before the inclusion in the classroom;
- information about the different cultural and educational context;
- information about standard learning/teaching styles in students' native countries.

The respondents outline the practice of “age-related inclusion” that implies a relevant discomfort concerning communication both for teachers both for students. Moreover, they claim the lack of a system to collect reliable information about individual previous curricula: generally very few of these can be found and they are not trustworthy in spite of the usefulness. Moreover they ask for official disciplinary programmes in use in the origin countries.