MATHEMATICS TEACHERS AND MULTICULTURAL CONTEXTS: REMARKS AND PROPOSALS

Franco Favilli
Dipartimento di Matematica, Università di Pisa, 56100 Pisa, Italy e-mail: favilli@dm.unipi.it

The wide migratory phenomena towards European countries are making it necessary to build up strategies for a better integration of immigrants in their new social contexts, including the educational one.

However, in some of these countries, like Italy [8], school systems are still inadequate to face the new issues related to the arrivals of many students from countries very different in terms of language, culture, habits, religion, social organisation, economics, etc. Often, it is hard even to find, in the official educational trends and curricula, traces in the direction of *multiculturality* and/or *multiethnicity*.

Therefore, everything basically depends upon the professional aptitude (and personal sensitiveness) of the teachers, who - because of their initial training background, too - are mostly not prepared to face the new experience.

So, their teaching strategies mainly aim to *integrate* the immigrant students through the *minimisation of* their *differences*, this way actually *creating inequality* in the class.

Then, the basic question is the following:

Is integration simply an adaptation to the local culture or is it rather a comprehension and an exploitation of different cultures?

A fairly large number of teachers has already been sensitised, by professional organisations and school institutions, to the multicultural and intercultural issues, in the attempt to create a wide theoretical and cultural web among them. However, very little has been offered in practical terms, except for the teaching of languages. Hence, the basic questions for non-language teachers are still unanswered: which are the *things to do?* which the right *didactical strategies? what* has *to be taught* in each specific discipline *and how?*

So far, in the classroom the teacher is really acting alone; not even the textbooks are very helpful.

How could this situation be attacked?

In our opinion, it should be acknowledged first that teaching and learning the local language cannot be the only and final answers to the educational problem; second, that each culture has its own knowledge, its way of facing the daily life. This *indigenous knowledge* concerns to any field of human activity and sciences; it even relates to a discipline like mathematics [2],[10] commonly and wrongly judged as a *universal and culture-free* science.

Therefore, the whole set of indigenous knowledge and *ethnosciences* cannot be totally and simplistically ignored! They should be used to make easier the educational (and social) integration of the students with a different culture in their new habitat.

However, how could it be possible to make all teachers of each every discipline expert in so many different cultures, like those represented in many European primary and lower secondary schools in the last few years?

An affordable approach to the problem could be experienced by training only a fairly low number of professionals, with the specific task to support those teachers having immigrant students in their class. Each trainee should be given an adequate instruction in fields like, for example, (physical, political and economic) geography and history of Afro-Asian countries, Islamic and oriental religions, cultural anthropology, linguistics, multiculturalism and, moreover, each of them should be qualified in a specific educational subject (e.g. language, literature, mathematics, life science).

These professionals could co-operate with the teachers, mainly out of the classrooms, helping

them to build up an adequate educational path for any foreign pupil and verifying its fulfilment during the school year. Each of these *intercultural mediators* could also be specifically qualified in a definite geographic area, like North Africa, Sub-Saharan Africa, Eastern Europe, Middle East, Asia, South America.
Intercultural mediators should try to co-ordinate the activities carried on by public structures to facilitate the achievement of the final goal of helping the immigrant students to become real citizens of their new country - while preserving their cultural roots and identities. The intercultural mediators should be the preferential reference for any other operator charged with the assistance to the immigrant students (and their families), mainly for social needs and issues.
With the so sketched competencies and duties, the intercultural mediators should then represent the *bridge between* the teachers of *today's monocultural school system and* the teachers of *tomorrow's multicultural one.*

In this global perspective, therefore, as far as mathematics is concerned, a significant role could be played by *multicultural mathematics and ethnomathematics*, with their large amount of theoretical and practical issues and researches (see, for example, [1], [3], [9]). Such issues and researches should be widely applied in the classrooms, using mathematical examples from the culture and the real life of different (non-western) countries in an educational path for all the class. The evaluation and the exploitation of these examples - not just in a folkloric way - will give the immigrant students the opportunity of appraising their own cultural heritage, while offering the other students a real chance for a better understanding and *acceptance* of the newly arrived school-mates and for drawing global advantage from their *cultural differences*.
As a matter of fact, it is quite easy to acknowledge that a diligent study of every single culture - even from culturally *poor* regions - can give the scholars and, through them, the teachers a surprising number of didactical hints for mathematics, at very different school levels, from the elementary to the upper ones. Referring to Africa, a great evidence of this fact was given by the classic impressive research by Claudia Zaslavsky [11] covering most of the Continent, by Paulus Gerdes for Mozambique (see [6], for example) and, more recently, by the author (and Jama Musse) [4], [5], [7] for Somalia, among the (economically) poorest countries in the world.
Actually, just to give an example, the way used by middlemen to communicate prices - through the fingers of their (hidden under a cloak) hands - while trading in Somali cattle markets, gives the teachers the possibility of bringing up (in different school grades) collective considerations and didactical debates about the figures of a number, the decimal and other numeric bases, the notion of order and position, the role of zero, the meaning of significant figures, *cutting off* and approximation of a number. At the same time, counting, adding and subtracting can become amusing tasks for young pupils, done by means of an original and unusual use of their hands.
Likewise, again in Somalia, the shape of nomadic people's huts (and the way of building them up) or of those in the rural villages, the structure of the farms (with the location of their houses) are good starting-points for an introduction and a first study of geometric solids and figures, symmetries, etc.
A similar role can be usefully played by the patterns of inlaid doors or windows in the towns and the inlaid typical artcrafts made out of several materials (wood, meerschaum, iron, ivory, silver, gold) and commonly used or worn in the daily life.

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