



Multiculturalism, Migration, Mathematics Education and Language

M³EaL Project International Workshop

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Literature on teaching mathematics in multicultural classrooms

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Our work here: language and Math teaching in multicultural/multilingual classes

- ❑ Little has been done in Europe as far as is concerned **the math teaching in multicultural contexts in the secondary school.**
- ❑ ‘The different languages and cultures present in the classroom make the teaching/learning process even more arduous than it already is, especially for pupils from minority cultures and/or with a migrant background’.
- ❑ How the project constitutes a suggestion? A proposal for replying these kind of situations **by providing to the teachers in the secondary a comprehensible data resource** on which they could build upon when teaching mathematics in multicultural/multilingual classes.

Why the literature review

- ☐ Allow the project's team to specify the conceptual framework/s that would inform the design/implementation of the activities proposed
- ☐ Provide the math teachers in the secondary with structured and easy to use research based data resources about the issues involved when teaching math in multicultural/ multilingual settings.

The literature review: setting the context

- ❑ The members of our interdisciplinary team (mathematicians and linguists):
 - ✓ discuss in profound concepts, issues and perspectives involved in such type of educational settings based on their own field of expertise.
 - ✓ study scientific reports from the European council data- base which attempt to delineate notions such as multiculturalism, multilingualism, minorities in education.

The literature corpus: how we proceed

- Every country review and provide a list of nationally-based and international resources as important to the projects' interests.
- The resources could be available in digital form or in print.
- At least five references should be in the national language.
- Materials for primary teachers with ideas interesting that could be applicable for secondary teachers.

The literature corpus: The categories

The corpus each country provides has been structured through the following categories:

- a) Didactical resources available to mathematics teachers working in multicultural contexts
- b) Literature on teaching math in multicultural classes
- c) Literature on the role of the language in mathematics teaching and learning
- d) Literature on teaching math and/or scientific subjects to L2 learners

A. Didactical resources available to mathematics teachers working in multicultural contexts

□ References and Web addresses for:

- Guidelines
- Didactic proposals
- Corpus of papers

In general, for material designed for supporting or training teachers for multicultural classes.

Examples of didactical resources (a)

- Favilli, F., Maffei, L. and Romanelli, C. (2009).
‘Disegni sulla sabbia (SONA) ed Aritmetica: quale relazione?’
http://www.scuolavalore.indire.it/nuove_risorse/disegni-sulla-sabbia-sona-e-aritmetica-quale-relazione/
- Favilli, F. and Romanelli, C. (2010). Indovinelli geometrici.
http://www.scuolavalore.indire.it/nuove_risorse/indovinelli-geometrici-2/

Examples of didactical resources (b)

- OECD (2012), *Indicators on the integration of immigrants (France)*

<http://www.oecd.org/migration/integrationindicators/#d.en.217290>

- OCDE (2012), *Les indicateurs sur l'intégration des immigrés et de leurs enfants*,

<http://www.oecd.org/fr/migrations/indicateursintegration/#d.fr.217290>

- *Muslim children education project (Greece). Guide training material and corpus of papers regarding Muslim children Education (Greece)*

<http://hdl.handle.net/10795/234>

<http://www.metaixmio.gr/images/evdoxos/24251.pdf>

B. Literature on teaching math in multicultural classes

Empirical research –based papers discussing varied issues, such as :

- the integrated nature of the social, cultural and linguistic aspects in mathematics teaching and learning,
- identities in the multiethnic mathematical classroom from students' and teachers' perspectives
- the socio-mathematical norms and their representations in classroom.

Examples of the literature on teaching math in multicultural classes

- D'Ambrosio U. Ethnomathematics: theory and pedagogical practice, I and II parts, *L'educazione matematica*, 1995, 2, n.3, 147-159 e 1996, 3,n.1, 29-48.
- Hnilica, K. (2010). *Stereotypy, předsudky, diskriminace. (Pojmy, měření, teorie)*. Praha, UK (CZ)
- Gorgorió, N., & Planas, N. (2005). Cultural distance and in-construction identities within the multicultural mathematics classroom. *ZDM-The International Journal on Mathematics Education*, 37(2), 64-71. (NO)
- Stathopoulou, C., & Kalabasis, F. (2002). Teaching mathematics to first grade Romany children through familiar every day money dealings. *Third International Mathematics Education and Society Conference*, Helsingor, Denmark. (GR)
http://www.mes3.learning.aau.dk/All_Doc.htm

C. Literature on the role of the language in mathematics teaching and learning

□ Literature which explore:

- The discrepancies between informal ways of talking and mathematical “register” as systems of meaning-making
- Communication issues in math multilingual classroom
- Different perspectives/didactical approaches for the teaching /learning of mathematics in multilingual classroom.

Examples of the Literature on the role of the language in mathematics teaching and learning

- Moschkovich, J., (Ed). 2011. *Language and mathematics education: Multiple perspectives and directions for research*. Charlotte, NC: Information Age Publishing.
- Barwell, R., Leung, C., Morgan, C. & Street, B. (Eds.)(2005). Language and Maths. *Special Issue of Language and Education: An International Journal*, Vol. 19 no. 2, pp.97-169.
- Norén, E. (2008). Bilingual students' mother tongue: a resource for teaching and learning mathematics. *Nordic Studies in Mathematics Education*, 13(4), 29-49.

D. Literature on teaching maths and/or scientific subjects to L2 learners

- These references draw mostly on L2 scholarship [e.g. CLIL - Content and Language Integrated Learning, translanguaging pedagogy etc.) and provide strategies that teachers can use to address needs in mathematics teaching.

Examples of literature on teaching maths and/or scientific subjects to L2 learners

- Coggins, D., Kravin, D., Coates, G. D., & Carroll, M. D. (2007). *English language learners in the mathematics classrooms. Thousand Oaks, CA. Corwin Press*
- Kersaint, G., Thompson, D. R., & Petkova, M. (2009). *Teaching mathematics to English language learners*. NY. Routledge'
- Languages in Education, Languages for Education
http://www.coe.int/t/dg4/linguistic/LangEduc/LEPlatformIntro_en.asp