

REN CONFERENCE 2023

Rome, Italy – May 12-13 2023

Università Niccolò Cusano

<https://www.renconference.it/>

Insegnare il calcolo mentale in contesti multiculturali: aspetti cognitivi, socioculturali e didattici

Teaching mental calculation in multicultural contexts: cognition, society, culture, and didactics

Maurizio Ali - Université des Antilles, INSPE de Martinique, Unité de Recherche Contextes, Recherches et Ressources en Education et Formation (CRREF), Équipe d'Accueil Sociétés Traditionnelles et Contemporaines en Océanie (EASTCO), Fort-de-France, Martinique. maurizio.ali@inspe-martinique.fr. ORCID : 0000-0001-7294-1422.

Manuel Garçon - Université des Antilles, INSPE de Martinique, Unité de Recherche Contextes, Recherches et Ressources en Education et Formation (CRREF), Fort-de-France, Martinique. manuel.garcon@inspe-martinique.fr. ORCID : 0000-0002-2983-7141.

Rosmery Fundora Cruz - Université des Antilles, INSPE de Martinique, Fort-de-France, Martinique. rosmeryfundora@gmail.com. ORCID : 0000-0002-9821-6410.

Topic 1: Le competenze per gli insegnanti e gli educatori nel terzo millennio

Abstract: Several research works have suggested that, in some marginalized and peripheral contexts, the low achievement of students in the field of mathematics is correlated with the negative representations associated with this field of knowledge, produced by cultural prejudices and stereotypes vehiculated by social institutions (as school) and families. Following this hypothesis, this paper presents the results of a study conducted in a multicultural context, the French West Indies public primary school system, using a psychometric tool (*Mathematical School Readiness Test*. N= 2710), combined with a sociological survey on mental representations of mathematics (N= 86). The results confirmed the pivotal role played by didactic issues and identify some teaching strategies aimed to facilitate the learning process associated with mental calculation.

Keywords: Didactics of mathematics, France, Skills development, Sociocultural context

Essential References

- Ali, Maurizio (2018). Educación inclusiva para los pueblos autóctonos: límites y logros del modelo francés. In A. Ocampo Gómez (dir.), *Tarea crítica de la educación inclusiva: contingencias epistémicas, emergencias metodológicas y discusiones para el presente* (pp. 21-50). Santiago de Chile, Chile: Centro de Estudios Latinoamericanos de Educación Inclusiva – CELEI.
- Ali, Maurizio (2020). The Education System in the French Departments of America: French

Guiana, Martinique and Guadeloupe. In J. Sieglinde e M. Parreira do Amaral (Eds.), *The Education Systems of the Americas* (pp. 583-606). Springer. https://doi.org/10.1007/978-3-319-93443-3_9-1

- Alì, Maurizio (2021). Antropologia e neuroscienze: l'umano e il suo cervello. In Francesco Peluso Cassese (dir.), *Ricerche in neuroscienze educative 2021: Scuola, Sport e Società* (pp.149-152). Roma: Edizioni Universitarie Romane - Università Niccolò Cusano.
- Alì, Maurizio (2022). Approcci socio-antropologici alle questioni educative: terreni, metodi e riflessioni epistemologiche [Editoriale]. *Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva*, 6(4). <https://doi.org/10.32043/gsd.v3i3.126>
- Alì, Maurizio (2022). L'umano e il suo cervello redux: riflessioni dal fronte. In Francesco Peluso Cassese (dir.), *Ricerche in neuroscienze educative 2022* (pp. 8-9). Roma : Edizioni Universitarie Romane - Università Niccolò Cusano.
- Alì, Maurizio (2023). *Autochtonie et question éducative dans les Outre-mer Une enquête comparative en Guyane et en Polynésie française*. Pointe-à-Pitre : Presses Universitaires des Antilles.
- Anciaux, Frédéric ; Delcroix, Antoine & Alì, Maurizio (2022). Réflexions sur l'enseignement des mathématiques en Outre-mer : synthèse des avancées de la recherche aux Antilles françaises. *Colloque Plurimaths 2022 : Contextes et pratiques multilingues dans l'enseignement de disciplines scolaires*. Université Paris Cité – IREM de Paris, 30 novembre – 1 dicembre.
- Ashcraft, Mark & Faust, Michael (1994). Mathematics anxiety and mental arithmetic performance: An exploratory investigation. *Cognition and Emotion*, 8(2), 97-125. <https://doi.org/10.1080/02699939408408931>
- Bishop, Alan (1990). Western mathematics: The secret weapon of cultural imperialism. *Race & Class*, 32(2), 51-65.
- D'Ambrosio, Ubiratan (1980). Matemática e Sociedade: Considerações Histórico-Pedagógicas. *Ciência e filosofia*, 2, 81-88.
- Delcroix, Antoine & Alì, Maurizio. (2022). Contextes éducatifs, contextualité des savoirs, contextualisation didactique : regards pluriels et perspectives transdisciplinaires [Éditorial]. *Contextes et didactiques*, 20 : 9-14. <https://journals.openedition.org/ced/4091>
- Garçon, Manuel (2022), Corpus de recherche. Résultats du projet Calcul Mental Africa2020 (volet 1 : test de calcul mental en Martinique). *Mendeley Data*, V1. <https://doi.org/10.17632/j9yfh482r4.1>
- Mejias, Sandrine ; Muller, Claire & Schiltz, Christine (2019). Assessing Mathematical School Readiness. *Frontiers in Psychology*, 10, 1173. <https://doi.org/10.3389/fpsyg.2019.01173>
- Pesenti, Mauro; Zago, Laure; Crivello, Fabrice; Mellet, Emmanuel; Samson, Dana; Duroux, Bruno; Seron, Xavier; Mazoyer, Bernard & Tzourio-Mazoyer, Nathalie (2001). Mental calculation in a prodigy is sustained by right prefrontal and medial temporal áreas. *Nature Neuroscience*, 4, 103–107. <https://doi.org/10.1038/82831>
- Rivera, Susana M.; Reiss, Allan L.; Eckert, Mark A. & Menon, Vinod (2005). Developmental Changes in Mental Arithmetic: Evidence for Increased Functional Specialization in the Left Inferior Parietal Cortex. *Cerebral Cortex*, 15(11), 1779–1790. <https://doi.org/10.1093/cercor/bhi055>
- Selin, Helaine (Dir.). (2000). *Mathematics Across Cultures. Science Across Cultures: The History of Non-Western Science*. Basilea: Springer.
- Weiss, Pierre-Olivier; Alì, Maurizio; Ramassamy, Cédric & Alì, Gabriella. (2021). Quelle continuité pédagogique en Martinique en période de confinement ? *Esprit critique - Revue*

internationale de sociologie et sciences sociales, 31(1), 71-100.
<https://espritcritique.hypotheses.org/855>

- Weiss, Pierre-Olivier; Alì, Maurizio, & Vilieva, Katharina. (2022). Visions périphériques : éduquer et former en temps de crise. In Weiss, Pierre-Olivier & Alì, Maurizio (dir.), *L'éducation aux marges en temps de pandémie : précarités, inégalités et fractures numériques*. Pointe-à-Pitre : Presses Universitaires des Antilles, pp. 13-38.
<https://doi.org/10.3917/pua.weiss.2022.01.0013>

Per citare questa comunicazione :

- Alì M., Garçon M. & Fundora Cruz R. (2023). Insegnare il calcolo mentale in contesti multiculturali: aspetti cognitivi, socioculturali e didattici. *REN Conference 2023: Research on Educational Neuroscience. Il futuro prossimo dell'educazione nell'universo digitale*. Università degli Studi Niccolò Cusano, Roma, Italia, 12-13 maggio. <https://www.renconference.it/>