

MATHEMATICAL LEARNING DISABILITIES: A CHALLENGE FOR MATHEMATICS EDUCATION

Cécile Ouvrier-Bufferet (coord)¹, Elisabetta Robotti², Thierry Dias³, Marie-Line Gardes⁴

¹ Reims Champagne-Ardenne University, France ² Turin University, Italy

³ HEP Vaud, Switzerland ⁴ Lyon University, France

CONTEXT

These last decades are clearly marked, at the international level, by an increase of research and a better comprehension of learning disabilities. Some of them remain complex and less studied (Lewis & Fisher, 2016). That is the case of *mathematical learning disabilities* (MLD) which are the source of raising educational and social inequalities. However, definitions of MLD remain elusive. MLD are often reduced to difficulties in processing numerical quantities and arithmetical calculations. In particular, they do not take systematically into consideration specific difficulties in mathematical reasoning. Recent publications point out that MLD are heterogeneous (Fias, Menon & Szűcs, 2013) and affect several aspects of mathematical skills (Kaufmann & al., 2013). Research regarding MLD is carried out in different fields, with various theoretical backgrounds, hypothesis and aims (Butterworth et al., 2011; Lewis & Fischer, 2016): cognitive sciences, neuroscience, psychology, mathematics education. Nowhere it appears a clear consensus about the definition of the MLD and about their diagnosis. Moreover, the links between these different fields of research are not obvious and should be improved. Our team (called RITEAM for “Recherche Internationale sur les Troubles dans l’Enseignement et l’Apprentissage en Mathématiques” i.e. “International Research on Learning Disabilities in Mathematics Teaching (see riteam.ch) consists of five researchers in mathematics education coming from several countries (France, Switzerland, Italy, Canada) where politics are concerned by the difficulties in the learning of mathematics and the processes of “inclusion” (e.g. “loi pour la Refondation de l’École”, 2013 in France; “Loi 170/2010 and Dir. 27/12/2012” of MIUR (2010 & 2012) in Italy; “De l’intégration à l’inclusion scolaire des élèves en difficulté d’adaptation et d’apprentissage”, CTREQ (2009) in Québec, Canada; “Accord intercantonal sur la collaboration dans le domaine de la pédagogie spécialisée”, 2007 in Switzerland). We claim that specific studies should be structured and developed in mathematics education regarding MLD in order to improve the identification and the remediation of MLD in an educational context. In particular, that implies a better knowledge of the existing research dealing with MLD. That is the reason why our team is working on these two main aims:

- To circumscribe research about MLD in mathematics education and to federate new collaborations in this field;

- To structure a collaboration at the interplay between mathematics education and cognitive sciences: we hope that such collaborations will evolve (following for instance De Smedt & Verschaffel (2010), Gardes & Prado (2016)).

PLANNED ACTIVITIES

The activities of this WG will be organized around the above-mentioned aims. We believe that research done in collaboration between several mathematics educators coming from countries over the world is a powerful tool for structuring and federating new trends regarding MLD in mathematics education. During the first session, we will present RITEAM and list major publications in the field (30 min). Then, we will break up into smaller groups in order to identify several current and future problematics about MLD (45 min). We will conclude and mutualize the results (15 min). The second session will start by the presentation of a free reference management software (15 min). Main ideas from the first session will help to build a structure in this software (definition of keywords, inventory of pertinent journals, identification of theoretical backgrounds, etc.) (1h). Such a classification and database can evolve during the two sessions, with the participants' experience in the field of MLD and/or mathematics education and through discussions and analysis in small groups and in plenum. The WG will end by concluding remarks and a definition of a future collaboration between the participants (15 min).

OUTCOME

The working session will bring a first collaborative inventory and classification of publications regarding MLD in mathematics education. The aim of this mutual tool is clearly a way to federate new collaborations in the PME community about education questionings and research regarding MLD.

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