

Title: **Focused MLD intervention based on the classification of MLD subtypes**

## Abstract

Doing mathematics requires a wide variety of skills pertinent to quantity, symbols, language, and space; accordingly difficulties may arise in any of these domains and Students with Mathematics Learning Difficulties (MLD), may present with different profiles. We herein suggest a classification scheme of MLD, based on clinical observations as well as cognitive psychology and neuroscience data, comprising of four subtypes with regards to the specific impairments presented: the Non-verbal, Memory, Visual-Spatial, and the Logical subtype. Specific systems involved and typical mathematical difficulties-abilities are listed for each subtype.

The present multidimensional etiological model proposes a transition from the unidimensional “Dyscalculia” to the multidimensional “Mathematical Learning Difficulties”, bringing into the picture mathematical domains other than the ones typically considered by the MLD literature until today. This leads to the second important feature: the model has direct implications for the field of mathematics education and may become an important tool for educators involved both in primary or secondary education. This is because the model allows to identify mathematical profiles of students early on, and these can be used to design more effective and comprehensive intervention programs, focusing on the students’ strengths to compensate weaknesses and provide motivation. Moreover, educators, from researchers to teachers, can use the model to easily create tasks for working with their students.

Currently, the author has developed a computer-based test based on the subtypes of the model, in order to validate it. The test has been administered to students in Greece and will soon be used for further validation during a study in Italy. The suggested classification model of MLD is expected to be clinically useful, as has been observed during the preliminary study of its validity that has been carried out. The proposed model offers a multidisciplinary approach, which can contribute to assessing MLD in a more thorough and accurate way, as well as to the design of comprehensive targeted intervention programs. The aim of the present oral presentation is to discuss the profile of each MLD subtype and to further describe applications of intervention focussing on each student's strengths.

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