Analysis of Dyscalculia Evidences through Artificial Intelligence Systems

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Abstract

Dyscalculia is usually perceived of as a specific learning difficulty for mathematics or, more appropriately, arithmetic. Because definitions and diagnoses of dyscalculia are in their infancy and sometimes are contradictory. However, mathematical learning difficulties are certainly not in their infancy and are very prevalent and often devastating in their impact. Co-occurrence of learning disorders appears to be the rule rather than the exception. Co-occurrence is generally assumed to be a consequence of risk factors that are shared between disorders, for example, working memory. However, it should not be assumed that all dyslexics have problems with mathematics, although the percentage may be very high, or that all dyscalculics have problems with reading and writing. Because mathematics is very developmental, any insecurity or uncertainty in early topics will impact on later topics, hence to need to take intervention back to basics. However, it may be worked out in order to decrease its degree of severity. For example, *disMAT*, an *app* developed for *android* may help children to apply mathematical concepts, without much effort, that is turning in itself, a promising tool to dyscalculia treatment. Thus, this work will focus on the development of a *Decision Support*

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System to estimate children evidences of dyscalculia, based on data obtained on-the-fly with *disMAT*. The computational framework is built on top of a *Logic Programming* approach to *Knowledge Representation and Reasoning*, grounded on a *Case-based* approach to computing, that allows for the handling of incomplete, unknown, or even self-contradictory information.

Keywords: Dyscalculia, Logic Programming, Knowledge Representation and Reasoning, Case-based Computing, Decision Support Systems.