# Brain Networks and Mathematical Learning Processes of Children

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**Abstract :** Neurological findings provide foundational results for many different disciplines. In this article we want to discuss these with a special focus on mathematics education. The intention is to make neuroscience research useful for the description of cognitive mathematical learning processes. A key issue of mathematics education is that students often behave as if their mathematical knowledge is constructed in isolated compartments with respect to the specific context of the original learning situation; supporting students to link these compartments to form a coherent mathematical society of mind is a fundamental task not only for mathematics teachers. This aspect goes hand in hand with the question if there is such a thing as abstract general mathematical knowledge detached from concrete reality. Educational Neuroscience may give answers to the question why students develop their mathematical knowledge in isolated subjective domains of experience and if it is generally possible to think in abstract terms. To address these questions, we will provide examples from different fields of mathematics education e.g. students' development and understanding of the general concept of variables or the mathematical notion of universal proofs. We want to discuss these aspects in the reflection of functional studies which elucidate the role of specific brain regions in mathematical learning processes. In doing this the paper addresses concept formation processes of students in the mathematics classroom and how to support them adequately considering the results of (educational) neuroscience.
**Keywords :** brain regions, concept formation processes in mathematics education, proofs, teaching-learning processes
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