of mathematical concepts, among other things also a test for the definition of the stage of formal-logical thinking and algebraic abilities. The essential development of integrating the four calculus operations happens at the age of 13–14, and the development of algebraic abilities at the age of 14–15. The introduction of abstract algebraic concepts (e.g., the concept of a variable) is possible when the development of algebraic abilities has been completed. The introduction of these concepts, though, must still be linked to concrete objects (ibid.).

It can be concluded that the path to deeper knowledge, which is applicable and complex, is neither easy nor fast, it is conditioned both on the student’s cognitive development and on the quality learning and teaching.

**Concluding findings**

The issue of examining the impact of approaches to learning and teaching on learning performance is an extremely demanding and complex one. In our research, we focused on three levels of mathematical knowledge: basic and conceptual knowledge, solving simple mathematical problems and complex knowledge. As evident from the paper, there are substantiated reasons for the assertion that the implementation of the process approach to learning and teaching mathematics, which we have produced ourselves on the basis of the theoretical knowledge of the mental development of children and recent findings about children’s thinking, significantly contributes to the quality of learning and teaching mathematics and to students’ academic achievement.

A positive impact of the process approach to learning and teaching mathematics is recorded both in the understanding of concepts and solving problems and in learning algorithms and calculation procedures. The research results show that mathematical conceptual knowledge is significantly related to solving simple mathematical problems and complex knowledge; learning with understanding, however, is a long lasting process associated with the cognitive development of the student and with quality teaching.

**References**


and reasoning (Proceeding of International Symposium Elementary Math Teaching) (72–81) Prague, the Czech Republic: Charles University, Faculty of Education.