

# Computer Algebra - the engine of transition to activity-based approach in mathematics education

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## Abstract

The paradigm of time-and-content based education gives nowadays way to the new paradigm of instruction-and-activity based education. The latter is a result of the widespread use of computer technologies. But are they oversold or underused in education? We still observe patchy implementation of these technologies in mathematics education. Computer technologies allow to introduce

- teaching strategies that aim to increase the autonomy of learners
- learning methodology that puts learner autonomy at its heart
- assessment strategies that interpret and use student achievement to make decision about the next steps in instruction.

The need of considering all the three components of the triad teaching-learning-assessment (TLA) in tandem and not focus on any one of them is discussed. The role of informed use of computer algebra in the TLA process is illustrated by means of appropriate applications. Authors' experience in developing instruction-and-activity based seminar and laboratory classes in calculus is shared. They support self-directed (independent) learning. Computer algebra systems serve as a knowledge and collaboration instrument not restricted to any particular didactical model.

## Keywords

Activity-based education; Mathematics with technology; Computer algebra; Calculus