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Learning precalculus with an interactive computer-based technology

Exposition to advanced mathematical thinking makes the ability to follow logic of a derivation and interpret formal content crucial for university students' success. Use of an interactive computer-based technology may assist the learners in extending from concrete to abstract thinking while improving their basic skills of doing routine mathematics accurately and efficiently. Experimenting and immediate feedback allow re-thinking of the fundamental concepts and validation of the action.

The development of new instructional media for introductory mathematics courses at Memorial University is a response to changing instructional setting and the call for improvement of students' understanding. Our online laboratory offered additional practice to 155 students studying pre-calculus in 2007. By solving online exercises and quizzes, sharing ideas and experiences, students built knowledge and confidence necessary for success. Besides that, the instructional media allows the instructor to monitor students' progress, also measured by paper tests, and record the changes in the students' motivation, perception, and interest in mathematics.

Along with a number of positive outcomes observed at the current stage of the project we would like to address several issues which include students' attitude towards computer-assisted learning, balancing workload and the assessment between computer based and traditional paper-and-pencil approach, and smooth merging of in-class and homework practice.

More details can be found in a short report submitted by the authors in *Making the Grade, v. 3: A compendium of data-driven case studies on the effectiveness of MyMathLab and MathXL* (M. D. Speckler, ed.) Pearson Education, 2009, pp. 22–23.