Inquiry and Didactic Instruction in a Computer-Assisted Context: a Quasi-Experimental Study

Preliminary Research Report

We compare the effect of incorporating inquiry-based sessions versus traditional lecture sessions, and a blend of the two approaches, in an elementary algebra course in which the pedagogy consistent among treatments is computer-assisted instruction. Our research hypothesis is that inquiry-based sessions benefit students significantly in terms of mathematical content knowledge, problem-solving, and communications. All students receive the same computer-assisted instruction component. Students are randomly assigned for the semester to one of three treatments (two inquiry-based meetings, two lecture meeting, or one of each, weekly). Measures, including pre- and post-tests with both open-ended and objective items, are described. Statistically significant differences have previously been observed in similar quasi-experimental studies of multiple sections of finite mathematics (Fall, 2008) and elementary algebra (Fall, 2009) with two treatments. Undergraduates, including many pre-service elementary teachers, who do not place into a credit-bearing mathematics course take this developmental algebra course.

Keywords. Elementary algebra, teaching experiment, computer-assisted instruction, inquiry-based instruction, didactic instruction.