The impact of technology-enhanced curriculum on learning advanced algebra in US high school classrooms

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Abstract We report on two large studies conducted in advanced algebra classrooms in the US, which evaluated the effect of replacing traditional algebra 2 curriculum with an integrated suite of dynamic interactive software, wireless networks and technology-enhanced curriculum on student learning. The first study was a cluster randomized trial and the second was a quasi-experimental replication study using a subset of the original treatment teachers. Both studies demonstrated significant impact on student learning of core algebra concepts including both procedural and conceptual problems. Various variables were modeled to understand the impact of such an intervention including demographic factors and class level. We found that being in an honors class significantly predicts learning gains but being in a non-honors SimCalc class significantly predicts learning gains versus all other groups. We also found significant effects of treatment on difference scores for problems which demanded simple procedural approaches and those that demanded complex conceptual understanding.

Keywords Simulations · Classroom connectivity · SimCalc · Randomized trial · HLM · Advanced algebra

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