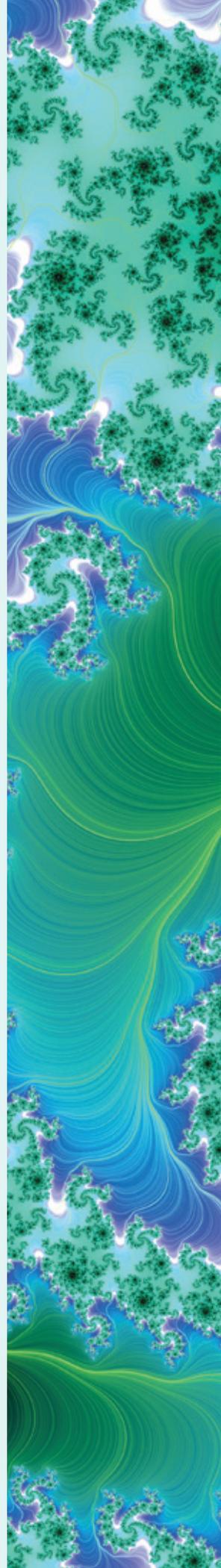


# Summative Research

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Pearson is committed to offering you the highest quality mathematics materials. In the following section, you will find ongoing research and efficacy studies in the classroom. The ongoing research includes longitudinal studies that involve the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs. The efficacy studies evaluate the revised program and validate the program's effectiveness



# Gatti Efficacy Study

Pearson has also partnered with the independent research firm Gatti Evaluation to implement a randomized, controlled trial efficacy study of the *Investigations* curriculum. The study is designed to meet the rigorous standards of the What Works Clearinghouse (WWC). The final report will be submitted to the WWC in further support of the efficacy of the program. The study will be conducted during the 2007–2008 school year, with a final report available in September or 2008.

The *Investigations* curriculum will be evaluated at grades one and four via a teacher-level randomized, baseline and post observation assessment research design to quantify the effect on student achievement, gauge student academic attitudes, and inform design improvements and best practice methods. Eight schools from four districts across the United States are participating in the study. Teachers from the study schools were randomly assigned to teach with either the *Investigations* curriculum or the basal mathematics curriculum designated for use by their district for one full school year. The students in these classrooms will be followed into the 2008–2009 school year to examine the longitudinal effects on student achievement.

The three main research questions for this study are:

(1a) Do mainstream first and fourth grade students making regular use of the *Investigations* curriculum over the course of one school year demonstrate a significant improvement in mathematics achievement and skill mastery?

(1b) Do mainstream first and fourth grade students making regular use of the *Investigations* curriculum over the course of one school year demonstrate higher mathematics achievement and skill mastery than their classmates making regular use of text-based basal mathematics curricula?

(1c) Do mainstream first and fourth grade students making regular use of the *Investigations* curriculum over the course of one school year demonstrate higher mathematics achievement and skill mastery than their classmates making regular use of competing activity-based basal mathematics curricula?

(2a) Do teachers and students using *Investigations* demonstrate positive attitudes toward mathematics instruction and the curriculum as a whole?

(2b) Do teachers and students using *Investigations* demonstrate significantly better positive attitudes toward the curriculum and mathematics instruction than their classmates making regular use of text-based basal mathematics curricula?

(2c) Do teachers and students using *Investigations* demonstrate significantly better positive attitudes toward the curriculum and their mathematics instruction than their classmates making regular use of competing activity-based basal mathematics curricula?

(3) How are teachers implementing the *Investigations* curriculum and how are students reacting to *Investigations*' activity-based educational environment?

The full results of these studies will be available to the public, and we welcome questions.

# An Indiana University Study of the Revised Investigations Curriculum

## Background of Study

As part of TERC's National Science Foundation grant to revise the *Investigations* curriculum, a subcontract was awarded to a team of researchers at Indiana University (IU) to conduct an evaluation study of the revised curriculum. NSF grants often require independent evaluations of grant activity, and the IU study was such an independent evaluation intended primarily for TERC's use. What was learned in this external study augmented the extensive internal field-testing TERC conducted as part of the revision process. Students in this IU study used field-test versions of the curriculum, since the materials were being developed at the same time the study was taking place.

Between 2002 and 2007 IU designed and conducted a longitudinal study focused on the content areas of number sense, computation, and algebraic reasoning, as these were focal points of the revision process. The longitudinal nature of the study meant that the same students were followed for three consecutive years. One cohort (I) of students was followed through grades 1, 2, & 3, and a second cohort (II) was followed during the same time through grades 3, 4, & 5. The second cohort included matched-comparison groups of students at schools not using the *Investigations* curriculum. Three study sites were used, one in the East, one in the Midwest, and one in the Southwest; however, only the East and Midwest sites contained matched-comparison groups. All schools were from districts with low to average income levels. Schools selected for comparison purposes were matched to *Investigations* schools according to socio-economic profiles, local geography, and prior achievement data. Additionally, standardized testing was done to control for initial differences in ability; however the small final numbers of students involved in the study made this control difficult. The total number of students in Cohort II East and Midwest (*Investigations* and comparison) sites decreased from 781 in Year 1 to 458 in Year 3, an attrition of almost 40%.

### Context Surrounding Study Findings

Despite working with districts believed to be very experienced with *Investigations*, or high implementers, no site was found to have implemented

the curriculum in a pure fashion. The supplementing that took place is perhaps due to increased pressure to perform on state tests resulting in more "teaching to the test" and using less of the adopted curriculum, personal teacher preferences based on teaching styles, etc. Also an increasingly low rate of return of implementation data from teachers as the study progressed suggested that logistical or managerial demands on teachers might be increasing reducing their time to attend to the details of our study. Implementation was also mixed in the comparison sites making it hard to identify precisely the role played by curriculum. However, the experiences of the schools in our study seem to be typical given the current educational climate, and amidst the increased pressures and compromised curricular implementations, some significant trends in achievement did emerge.

## Findings

In the East, *Investigations* students did significantly better on all of the IU assessments and on all the state-mandated standardized tests than did students from the matched-comparison schools studying a different curriculum, and these differences were consistent across grades 3, 4, and 5. In the Midwest, *Investigations* students' performance on the IU assessments and on the state tests was not significantly different from that of students from matched-comparison schools studying a different curriculum. Consistent with previous studies, this study found that students studying *Investigations* perform as well as or better than similar students studying different curricula. These overall preliminary findings for Cohort II should be put in careful perspective. As with any study, this study is just one of many and any informed position about *Investigations* should be based on all the evidence available from multiple sources. The context for this study, although not ideal from a purely experimental viewpoint, is realistic and typical of many schools. Thus, while the study context was not ideal, the findings are statistically valid given that context. The study raises questions about what factors are critical in coherently implementing a mathematics curriculum. Experience from school systems that have implemented *Investigations* most successfully, with significant gains in student achievement, indicates that a comprehensive plan for consistent implementation and long-term commitment to professional development for teachers are keys leading to improved learning and teaching of mathematics.

The director of the Indiana University study is Dr. Paul Kehle who can be reached at [kehle@hws.edu](mailto:kehle@hws.edu) Other leaders of this study are Diana Lambdin and Kathy Essex at Indiana University, and Kelly McCormick at the University of Southern Maine.

# Mathematica Study

In response to a mandate from the U.S. Department of Education, the Institute for Education Sciences (IES) has developed a study to evaluate the effectiveness of elementary mathematics curricula. A request for proposals was sent to all publishing companies to submit math curricula for inclusion in the study. The *Investigations in Number, Data, and Space* curricula was one of only four curricula chosen for inclusion in the study from dozens of applicants.

*Investigations* was chosen for its research-based instructional practices, appropriateness for all learners, and evidence of program efficacy. The study is employing a randomized, controlled trial design, with the research conducted by the independent company Mathematica Policy Research, Inc. Four districts participated during the 2006–2007 school year. A total of eleven school districts are participating during the 2007–2008 school year from ten states. *Investigations* will be implemented in 60 classrooms across the United States as a result of their participation in this study. Mathematica will release an interim report in the summer of 2008 with efficacy data for each curriculum.

The two main research hypotheses are:

- (1) What are the relative effects of different early elementary math curricula on student mathematics achievement in disadvantaged students?
- (2) Under what conditions is each mathematics curricula most effective?