

An Indiana University Study of the Revised *Investigations* Curriculum

Background of Study

As part of TERC's NSF 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. Other leaders of this study are Diana Lambdin and Kathy Essex at Indiana University, and Kelly McCormick at the University of Southern Maine.