Reforming Elementary Science Education

in

Urban Districts

Reflections on a Conference
Inverness, California

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In January 1994 the National Science Foundation sponsored a small, informal conference focused on reforms in urban elementary science education. Held in Inverness, California, and coordinated by Inverness Research Associates, thirty five participants from across the nation attended. Coming in teams of three or four, the participants included university faculty, teachers, museum professionals, and district administrators. They represented seven urban school districts -- Baltimore, San Francisco, Cleveland, Pasadena, Las Vegas, New York City (District 6), and Buffalo. In addition others involved in elementary science reform also participated, including staff from the NSF, a reporter from *Education Week,* and a small group of researchers from Inverness Research Associates.

The Genesis of the Conference

The Urban Elementary Science Conference was, in many ways, the result of collective inspiration. Over the previous five years or so, we at Inverness Research Associates had the opportunity to consult with and evaluate five different NSF-supported elementary science reform projects, all centered in urban districts. As we became familiar with the unique circumstances these urban efforts faced, we began to gain some insight into the underlying and predictable patterns of their evolution, and the similarities of the issues they faced. In addition, we began to note the wide array of strategies they employed to address the complex and problematic urban landscapes in which they all functioned. As we traveled from project to project, we became itinerant storytellers, sharing with one district project news of what had occurred in another, passing on bits of knowledge and experience from one to the next.

Thus over the course of several years -- through their common evaluator, through their common NSF program officers, and through word of mouth -- these separate but somewhat similar elementary science reform projects became familiar to one another. However, we at Inverness Research had the greatest opportunity to visit the different districts and, thus, we were primarily the ones who were "getting smart." It began to become apparent that it would be highly beneficial for the districts themselves to learn directly from one another, and for the field at large to begin to mine and pool their collective wisdom. With these two goals in mind then, the Urban Elementary Science Conference convened in Inverness in January 1994.

The Design of the Conference

Several design features of the conference, some calculated and some serendipitous, are worth noting here insofar as they seemed to be important to the overall success of the event. First, the notion of bringing districts together to talk with one another had strong antecedents in the EDC's (Educational Development Center) 1990 conference, where 26 districts had been invited to meet together to discuss the critical issues and needs of cities undergoing science reform. The Inverness Urban Elementary Science Conference sought to duplicate the EDC conference's focus on practitioners' knowledge, and to offer a forum to people with common experiences but few opportunities to share them with one another. Moreover, the underlying design principle on which the conference was based was mutual education and collegial sharing. Like "teachers teaching teachers," this approach seemed appropriate because the greatest expertise resides in those working in the field.

Second, the Urban Elementary Science Conference was organized around case studies. We here at Inverness Research had been impressed with the power of case studies to move individual and collective thinking beyond the popular rhetoric of reform. While developing case studies of schools involved in the Cleveland CREST project, we had learned that specific examples of school-based science reform efforts could serve as illuminative concrete realities, and often as microcosms that help to illustrate, in familiar experiential terms, more general lessons about reforming elementary science education. At the conference four districts were asked to present case studies of their projects, with a half day devoted to each district. From these particular cases, and with the other three districts contributing reflections about their own work, the group examined general issues in specific contexts. In the last few sessions of the conference, we tried to look more broadly across the cases and to glean general lessons learned about elementary science reform in urban districts.

Third, scientific inquiry served not only as a topic of conversation, but also as the mode and the spirit in which the conference was conducted.

> *At this conference we are all inquiring into a phenomenon, but the phenomenon is not light or color. It is not magnetism. But rather the phenomenon is elementary science and the process of change in districts and schools ...*[1]

The inquiry mode was deliberately fostered in order to transcend the normal "show and tell" culture of professional conferences, and to help lay a foundation for the building of a community of practitioners and learners focused on urban elementary science education. The participants came together not with the sole intent of presenting what had been done already, or even with the belief that they could find answers in the stories of other districts. Rather, they were participating in an inquiry of their own, searching for the unknown ways to facilitate effective, institutionalized change in their systems.

> *Our project is an inquiry and the inquiry is about how to create good hands-on teaching and learning.*

Indeed, we and the participants were quite struck by the candor and the quality of the discussions that took place. True to the spirit of inquiry, conference participants were seeking answers (as opposed to giving them) and this contributed to an overall tone that was collaborative, open and relatively risk-free.

Over the course of the three days, the notion that they were a community of inquirers, not a community of experts (and the fact that there really were no experts at this endeavor) permeated the conversations. Perhaps also, the realization that they all were working hard for the sake of the children in their communities, and that it was very difficult work, created a bonding and a real camaraderie.

This Monograph

This monograph attempts to capture and reflect upon three days of presentations and conversations concerning urban systemic change. We had hoped, perhaps naively, that the conference would yield some set of clearly defined lessons. This was not the case.

[1] Throughout this monograph we have inserted quotations from the conference. These quotations are reconstructed from conference tapes and are edited to convey the intended meaning more clearly. We have done our best to make these edited quotes correspond with the originally intended ideas as they were expressed in the context of the conference discussions.

Rather, the conference participants seemed to agree on the complexity, the confusion and the underlying tensions involved in their work to reform elementary science education.

It is important to note that this monograph does not attempt to be comprehensive, nor does it present a literal set of proceedings from the conference. The ideas presented in this monograph also draw upon our experience in evaluating elementary science education projects in many of the districts attending the conference. This monograph, therefore, is more of a collective essay in which we hope to share some thoughts and insights. Like other essays, it says as much about who we are as it does about the projects that are represented. We have shared our drafts with those who attended, and we have tried to incorporate their thoughts and reflections. Not so much out of valor, but out of honesty, we share full credit with them for any good ideas contained here, and assume for ourselves all the responsibility for this monograph's shortcomings.

Following the introduction, the monograph contains three major sections. Section II presents our abbreviated summaries of the four case studies -- Cleveland, San Francisco, Pasadena and Baltimore -- that were presented at the conference. Section III describes a list of "critical elements" which we feel must be present if districts are going to be successful in implementing inquiry-based, hands-on science across an entire district. Finally, Section IV presents some of the lessons learned about the design of the projects, and the critical choices each project had to make in allocating their scarce resources toward the reform effort.