Title:

A multi-phase model for scaling up a research-validated instructional intervention: Implications for leadership of systemic educational reform

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Objectives/Purpose

Over the past 20 years, an increasingly important emphasis in school reform has been upon identifying research-validated, instructional initiatives that have the potential to improve student achievement. Building upon this, a complementary research literature has begun to address the related issue of identifying the conditions under which effective instructional initiatives can be sustained and expanded. For example, in his study of Chicago schools, Payne (1997; 2001) identified problematic elements which cumulatively undermined the implementation of effective reform initiatives. These included dysfunctional relationships among teachers, school administrators, and central administrators which interfered with actual program implementation -- even though all parties were in agreement about goals and means. As others (see Blumenfield, 2000; Coburn, 2003; Elias et al, 2003; Klingner et al, 2003) have noted, the fact that highly effective programs often come and go with little lasting impact is a substantial barrier to advancing systemic school reform.

The purpose of this paper is to report findings emerging from the initial two years of a five-year, IERI/NSF-funded project designed to develop, study, and refine a multi-phase scale-up model that addresses the issue of concurrently expanding and sustaining a systemic, research-validated, instructional intervention, Science IDEAS (Romance & Vitale, 2001), in grades 3-5. In doing so, the paper describes (a) the evolution of the multi-phase scale-up model over the past two project years, (b) the operational dynamics used to implement the scale-up model along with the criteria for establishing its effectiveness, and (c) the leadership and organizational factors necessary for sustaining advocacy for the instructional intervention. In doing so, the paper also will offer perspectives and recommendations in a form that are applicable to scaling up any systemic instructional intervention within an ongoing school reform initiative.

Perspectives/Theoretical Framework

Understanding the Science IDEAS model as an implementation focus for scale-up. The issues addressed in the paper follow from an understanding of the Science IDEAS intervention for which the present scale-up model was developed. As described by Romance and Vitale (2001) and Vitale and Romance (2000), Science IDEAS is an integrated instructional model for teaching in-depth science understanding in grades 3-5 within which reading comprehension and language arts are integrated. Science IDEAS is implemented through daily 2-hour instructional blocks that replace traditional reading/language arts instruction. Across daily 2-hour lessons, teachers involve students in a variety of activities that focus on understanding science concepts (e.g., reading from text and trade books, hands-on activities, constructing concept-oriented propositional concept maps, journaling, and writing). As a highly systemic classroom intervention, Science IDEAS provides a stringent test of the project multi-phase scale-up model.

As reported by Romance and Vitale (2001), multi-year research findings showed that Science IDEAS students consistently obtained significantly higher achievement than comparable controls in both science and reading comprehension as measured by nationally-normed tests. Across studies, Science IDEAS achievement effects were consistent for both average/above average, and low-SES/minority students. Research findings also showed that Science IDEAS students displayed a more positive attitude and greater self-esteem in science learning and reading comprehension.

Consistent with the general findings reported by Payne (1997; 2001), virtually all of the involved professionals (e.g., teachers, principals, central administrators) viewed the Science IDEAS model as effective and considered themselves supportive. Yet, after a researcher-initiated expansion of the model over a 4-year period to over 60 teachers and 1200 students in grades 3-5 came to an end, subsequent use of the model gradually diminished until it was used by few teachers. Given this historical context, the paper reports how the multi-phase scale-up model used in the present IERI/NSF project has been able to not only re-start the Science IDEAS intervention; but also to address the requirements the literature (see Blumenfield, 2000; Coburn, 2003; Elias et al, 2003; Klingner et al, 2003) has identified as necessary to transform a research-validated, instructional intervention from being researcher-initiated on a small scale to school-system-adopted on a large scale.

The present Science IDEAS IERI/NSF scale-up initiative (which began in 2002) was designed to operate within a leadership and organizational framework that focuses upon two keys recognized as critical for sustained school adoption of any research-based initiative: (a) the adoption of a multi-faceted scale-up process (e.g., Ball & Cohen, 1999; Tyack & Cuban, 1995) and (b) the associated development of the capacity to implement the scale-up process itself (e.g.,

King & Newmann, 2000; Mussel, 1998). With this in mind, the present scale-up model focuses on feasibly developing the capacity of a district (and district schools) to implement the instructional intervention on a large scale through an evolutionary process.

Key elements of the evolution of the present multi-phase scale up model. The research design (and goal) of the present IERI/NSF scale-up project is to concurrently initiate the successful scale up of the Science IDEAS intervention while studying and documenting the evolution of the model from a research perspective. Thus, within the project, the validity of the multi-phase scale-up design must be established by its success in scaling up the Science IDEAS intervention. In turn, given the establishment of the validity of the scale-up model itself, the primary goal of the project is to explicate the constituents of the scale-up process in a fashion that allows it to be transportable to other interventions in other settings.

Before overviewing the multi-phase scale up model itself, it is important to recognize that the present Science IDEAS scale-up initiative reflects an explicit research and development (R&D) perspective. The emphasis of such an instructional systems design perspective (e.g., Dick et al, 2001) is that the successful preparation of any educational product requires two major elements: (a) that the desired outcomes can be obtained consistently under specified implementation conditions, and (b) that the implementation of the product in applied settings is engineered to fall within the capacity of the system that is to utilize it (minimizing capacity development requirements). Within the present context, such an R&D approach provides a framework for approaching the question of how to scale-up research-based initiatives within regular school settings. Thus, in our present research project, our definition of scaling is a functional one that establishes as success criteria and links together (a) the fidelity of implementation of an intervention and (b) the performance outcomes established through the prior research for the intervention that are to be met as performance standards. Specifically, if fidelity of implementation and the associated outcomes can be maintained at existing sites while the intervention is being expanded to new sites, then scale up can be considered successful.

Within this framework, we consider scaling from three different perspectives that provide the dynamics for accomplishing the two sets of criteria (fidelity, outcomes) over time. The first perspective considers scaling as a multifaceted process that consists of three overlapping and interdependent conditional criteria relating to the implementation of an instructional intervention: sustainability, expansion to new sites, and supportive institutional dynamics that are necessary to provide the continuing dynamics for scale up support (and sustainability). The key to all of these is the development of the internal systemic capacity for supporting the expansion of the initial implementation to new sites in a fashion that insures the cumulative sustainability for all. In our

multi-phase scale up design, the establishment of sites as model schools which are able to sustain implementation of an intervention with fidelity and obtain consistent performance outcomes provide the major source of internal systemic capacity for scale up by providing mentoring assistance. The third conditional criteria associated with scaling has to do with the establishment of administrative dynamics in the form of increased student performance expectations that recognize the "added systemic value" provided by the intervention and, therefore, the systemic incentive for sustainability and scale up.

The second perspective of the model considers scaling as a transformational process whose scope encompasses an ordered evolution from a researcher implementation, to a collaborative implementation with school personnel emphasizing systemic capacity development, to the transfer of the responsibility of the implementation from the researchers to school personnel. This second perspective recognizes that an agent must provide an enhanced resource capacity beyond the scope of regular school system operations by operating in a prosthetic fashion to develop the capacity of the school system to sustain and scale up an intervention. In our study, this agent consists of the project staff. The operational details of each of these phases will be discussed in the paper.

The third perspective consists of combining the preceding two perspectives together to provide a conceptual framework for representing essential project scale up operations in a form that is transportable to other settings and for framing research on scale up itself.

Methods/Techniques/Modes of Inquiry

The study was conducted in two large urban school districts in southeastern Florida and a mixed-method design was used to investigate different aspects of the project. The overall quantitative design to assess academic and affective performance effects of the intervention used a controlled-randomized methodology to compare participating vs. control schools. Fidelity of implementation was assessed using structured classroom observations on 9-week cycles. Professional development evaluations used a previously-validated, objective-oriented Likert scale. Documentation and analysis of different aspects of the project scale-up model were conducted using qualitative data-analysis approaches.

Data Sources/Evidence

Data were collected from four primary sources: participating teachers (N= 210), principals (N=11), grade 3-5 students (N=3200), and project staff. Included as data sources were project/principal fidelity of implementation ratings, preliminary school performance outcomes on

nationally-normed and state-administered accountability tests (detailed student data are not available until mid-August but will be included in the paper), and evaluations of professional development conducted by teacher leaders/mentors. In addition, the results of qualitative analyses of different components of the project scale-up model will be summarized from a systems perspective.

Results and Conclusions (Brief Summary)

Operational scale-up/implementation issues addressed. These included (a) adding a formal start-up planning component for new schools to the original scale-up model, (b) limiting new participant schools to those who had no competing instructional initiatives, (c) expanding the role of the project teacher leadership cadre from model classroom implementation to active involvement in professional development for new schools, and (d) providing ongoing professional support for teachers that focused on gaining in-depth understanding of science concepts within a grade level curriculum planning setting.

Revisions of key project scale-up strategies. These included (a) working with schools and teachers to increase implementation fidelity, (b) working with principals to actively involve them in the fidelity monitoring process (a key capacity development scale-up component), (c) developing project "talking points" to enhance principal communication (advocacy), and (d) developing district-level commitment to and advocacy for the project in a form that raises the student performance expectations held by the institution itself.

Preliminary project data analysis. These included (a) significantly improved fidelity of implementation trends over the past project year as assessed on a 9-week basis by project staff (the increase in teachers implementing Science IDEAS fully (vs. partially) rose from 43 to 65 percent), (b) school-level achievement summaries for 2002-2003 and 2003-2004 showed the average median SAT-9 percentile ranks in grades 3-5 for the project schools in reading were 69 and 70, respectively, while the percent of students in grades 3-5 judged proficient in FCAT reading were 68% and 70% (even though the districts' regular reading/language arts basal reading programs were not used), and (c) the ratings of concurrent summer 2004 (2-week) professional development sessions conducted by Leadership Cadre Teachers for new schools were rated as highly effective by participants (mean of 3.4 on a 4 3 2 1 scale). The overall effectiveness of the Teacher Cadre was a significant project capacity development accomplishment.

Educational/Scientific Importance

The paper addresses a significant issue for advancing the potential of school reform initiatives to improve student achievement. By framing the process of scale-up as a series of organizational actions adopted by schools and school systems, the paper is suggestive of the means to enhance the success of school-based implementations of research-validated instructional interventions. In a related fashion, the elements of the multi-phase scale up model also provide possible reasons why past scale up initiatives within school reform initiatives may have failed.

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