

Division L: Educational Policy and Politics

**Urban Systemic Reform:
A Discussion Among Policy Makers, Implementors, and Evaluators
Interactive Symposium**

Cross-Site Evaluation of the Urban Systemic Program

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This paper draws on data from the on-going Cross-Site Evaluation of the Urban Systemic Program undertaken by COSMOS Corporation through its contract with the Division of Research, Evaluation and Communications, Directorate for Education and Human Resources (REC 9912173 BO8994X) of the National Science Foundation (NSF). Any opinions, findings, conclusions, or recommendations expressed in this paper are those of the participants and do not necessarily represent the official views, opinions, or policy of the National Science Foundation.

A. The National Climate

Urban systemic reform is occurring within a still larger national context of raised standards and increased accountability. The national movement seeks, for the first time, to ensure that all students receive adequate preparation to go on to college.

B. NSF Objectives

NSF's Urban Systemic Program (USP) has the objective of providing urban school districts with funds to be used as a catalyst for ensuring that all students take and successfully complete standards-based, inquiry-centered classes that will place them solidly on a trajectory for college.

C. Indicators of Success

COSMOS Corporation, in undertaking a cross-site evaluation of the Urban Systemic Program, must gauge the accomplishments of NSF's programmatic objectives in light of the national climate and the unique characteristics of urban districts.¹ In studying the three USP cohorts, COSMOS must examine two broad questions:

1. What progress has been made in accomplishing USP objectives?
2. What set of factors must be in place to support and to sustain standards-based, inquiry-centered reforms in science and mathematics education?

D. Findings

Systemic reform is a process that engages the entire school system around one vision of change and then mobilizes all of its resources for the purpose of bringing that change to fruition. The USP evaluation is designed to describe the reform process in all of its incarnations as it is put in place and to determine the extent to which the intended benefits to students have been obtained.

¹ COSMOS Corporation is undertaking an evaluation of the Urban Systemic Program an initiative of the Division of Educational Systemic Reform (ESR) at NSF. The study is assessing the reforming process and program effects on student outcomes in mathematics and science education among USP school districts beginning with Cohort 1 sites: Brownsville, Dallas, Detroit, El Paso, and San Francisco. During the second year, an additional group of sites was added as Cohort 2: Birmingham, Chattanooga, Chicago, Fresno, Miami-Dade, Minneapolis, Newport News, Oklahoma City, Memphis, Nashville, Omaha, Philadelphia, and Pittsburgh. Cohort 3 includes nine more sites. The five-year study will result in a comprehensive cross-site analysis that draws on information received from the sites, archival data from national and state sources, documentary evidence, focus groups, and surveys of school districts. Relevant case study topics include NSF's six "drivers" of systemic reform.

District-Wide Reform - Does it Do What it Promises?

This part of the presentation will focus on describing the progress that has been made in instituting science, mathematics, and technology (SMT) educational reform and the difference this type of reform has made in the academic lives of public education students and the school districts they attend. More information and experiences are emerging as a result of evaluations such as the COSMOS study. As this and other studies continue efforts will increasingly shed light on the strategies of reforming as well as the effects of reforms on student learning. To date, preliminary findings suggest the following:

State and school district policies have been put into place in USP districts. These policies are designed to guide the reform of science, mathematics, and technology (SMT) education. Policies have centered around raising standards for all students including requirements for graduation, and implementation of a standards-based curriculum and student assessment system.

Social promotion has been virtually eliminated from USP school districts. Gateway courses are being introduced in more and more school districts. These efforts are designed to insure that students have mastered a set of required skills before going on to the next academic level. Thus, students are expected to meet the required standards at each level in order to matriculate.

Standards-based instruction, though not fully operational, is now embedded in most curricula. What students should know at each grade level in science and math has been articulated at the state and district level for most of the USP districts throughout the nation. Student proficiency requirements have been established for core courses and district-wide tests are continuing to be developed in most districts. Nonetheless, many teachers are still developing a working knowledge of standards-based instruction.

Graduation requirements for math and science are now set at higher levels for nearly all students in nearly all USP districts. Graduation requirements include a minimum of three years of higher level science and mathematics in nearly all USP sites. More and more high school core courses required for graduation also mandate that students pass a districtwide test before the completion requirements are fully satisfied. An emerging requirement is that students must pass district-wide end-of-course tests. This is occurring mostly at the high school level.

High standards and equity? Equity in education is being increasingly redefined throughout the nation. There has been some concern expressed as to whether the majority of students can master higher level courses such as Algebra and Chemistry. The expectation now is that all students will receive a college preparatory education that adheres to world class standards.

Over time the number of students taking higher level math and science courses is rising dramatically. Under-represented student populations are taking college preparatory classes at a greater rate than their peers. Close to 100 percent of all students in many USP districts are taking Algebra 1 and Biology 1. Students taking these more difficult courses are passing them at an increasing rate (see Exhibits 1 and 2 at the end of this document).

Why are students doing better in more difficult courses?

1. Students have a significant number of opportunities to learn. Multiple avenues of support are available to students having difficulties. Before and after school tutoring, Saturday study groups, in-school study groups, as well as summer school or summer camps have become available to students needing help with difficult courses.

2. The “peeling the onion” approach to instruction is working. What seems to make the most difference in the long run is articulating a K-12 curriculum that enables students to learn a way of thinking along with a set of basic skills at more complex levels as they advance in their studies. For example, learning estimation is one skill that can start as early as kindergarten. With this preparation, when students get to the point of solving for an unknown, the solution is totally within their frame of reference.

3. Course standards reflect what students should know at every stage of their academic development. Specifying what students should know and determining what they have learned are two crucial steps in the learning process. Making sure students are well prepared for the next set of challenges they will face when they matriculate is an important step in meeting the requirements of achieving in a high-standards environment.

Are students test scores improving? State and district tests are important indicators of whether students are learning the skills they need. Findings suggest that students who take higher order math and science courses increase their test scores and that the gap in performance between underperforming and high-performing students is decreasing. The rate at which test scores increase has also been found to be greater for minority than for non-minority students.

Preliminary findings suggest that several components are key to supporting and sustaining SMET reforms.

A vision or strategic plan. The breadth and depth of systemic reform suggest that the visions for reform initiatives should coincide with the visions for the entire district or state system. For the most part, USP reforms are aligned with district strategic plans but this alignment needs to be strengthened and reinforced, year after year. This is particularly so when plans are revised or updated.

The congruence of the USP vision with district leadership often facilitates reforms. For example, of 13 USP sites, 8 have leadership teams that also hold the top mathematics and science positions in the district. Likewise, changes in district superintendents can impact the relative position or importance of the USP team.

Coverage and Scale-Up. More than half of USP sites have been focusing on the entire K-12 system, in both mathematics and science. However, at some sites, reform efforts have started at particular grade levels or in one academic subject but not the other. USP has helped these sites to expand their coverage to the remaining portions.

It should be noted that districts often have other priorities that affect the USP focus on mathematics, science, and technology. For example, at some sites, literacy and mathematics have been the reform priorities, while at others, science and mathematics reforms have led to reforms in other subjects.

Scale-up plans may follow a conventional route with a concentration on middle schools and a push then to expand coverage to elementary and to high schools, or they may begin at the elementary level and move upward through the K-12 system. Still other schools initially focus on a given number of feeder groups, with plans to add more feeder groups each year until scale-up is complete.

Less obvious scale-up issues include the provision of professional development or partnerships with institutions of higher education (IHEs). IHEs may provide programs for some grades but not others. Scale-up strategies also address teacher turnover or slippage (i.e., training a 3rd grade teacher during the summer who is then assigned to teach in another grade or subject in the fall).

Partnerships. Only through partnering can the entire set of institutions that are part of systemic reform—perservice institutions, community and business stakeholders, parents and other groups directly involved with the education of the student (e.g., informal science education), and providers of professional development—become a more coherent system.

USPs have formed numerous and significant partnerships with organizations, particularly IHEs. Partnerships with IHEs typically cover either preservice training or professional development or both.

Policy conditions and constraints. Putting the desired policies into place can be an effective way of promoting reform. A number of USP sites have laid the foundation for reforming mathematics and science education by aiding districts to more clearly articulate policies governing standards-based curricula and instruction, strengthen course offerings, and tighten graduation requirements. These more rigorous policies are in place in nearly every USP district. However, policies also can be reversed as was the case in one USP district where graduation requirements were reduced from three to two years each of mathematics and science.

State policies also influence district practices and appear to have an increasingly important role among USP districts. A common type of state policy impacting USP efforts is the use of specific assessments. Usually these cover mathematics and literacy, and often there is no state assessment for science. In addition, state policies influence districts through end-of-course completion requirements, exit exams, or graduation requirements. State policies also can cover professional development requirements, often strengthening them in terms of certification, recertification, and graduation from teacher preparation programs.

Alignment of curriculum and assessments. Systemic reform means making efforts to assure that all components of the systems are aligned and therefore work together. The most important type of alignment thus far appears to be between assessment tools and curriculum. However, there are so many assessments for different grade levels and academic subjects that perhaps half of the USPs still have at least one grade level, for at least one subject, that is less aligned. In particular, some state-mandated assessments are not standards-based, resulting for some districts, in a mixed or unaligned set of objectives.

High-Stakes Accountability and Systemic Reform. Whether high-stakes accountability, where student test performance is used to assess student, school or district performance under conditions of severe sanctions for low performance, complements or competes with reform remains to be seen. For, when the high-stakes accountability tool is aligned with standards-based curricula, high-stakes accountability may support reform. When the tool is not aligned, high-stakes accountability may not support reform.

Even though some USP sites show improvement over time, if the absolute levels of performance fails to keep pace with the rate of improvement statewide, takeovers may occur despite the improvements. The performance of USP sites as a group corroborate this condition. Some level of takeover for low performance is occurring in at least three USP sites.

E. How the Cross-Site Evaluation is Advancing Research on Systemic Reform

The attention devoted to conceptual challenges has tended to override an equally important research problem—the problem of measuring reform. The COSMOS study is working to articulate the hypothetical states of a reforming system and a corresponding metric (see attached Hypothetical States of a Reforming System and Metric).

References

COSMOS Corporation. Reforming K-12 Mathematics and Science Education, Ongoing Lessons, Second Annual Report, submitted to the National Science Foundation, December 2001.

COSMOS Corporation. Update and Ongoing Work, Cross-Site Evaluation of the Urban Systemic Program, submitted to the National Science Foundation, February 2001.

Kim, J., et. al. Academic Excellence for All Urban Students, Their Accomplishment in Science and Mathematics, Systemic Research, Inc., April 2001.

Kim, J., et. al. Raising Standards and Achievement in Urban Schools: Case Stories from CPMSA in Hamilton County/Chattanooga and Newport News Public Schools, January 2002.

Exhibit 1
INCREASE IN MINORITY ENROLLMENT
IN HIGHER ORDER MATH AND SCIENCE COURSES

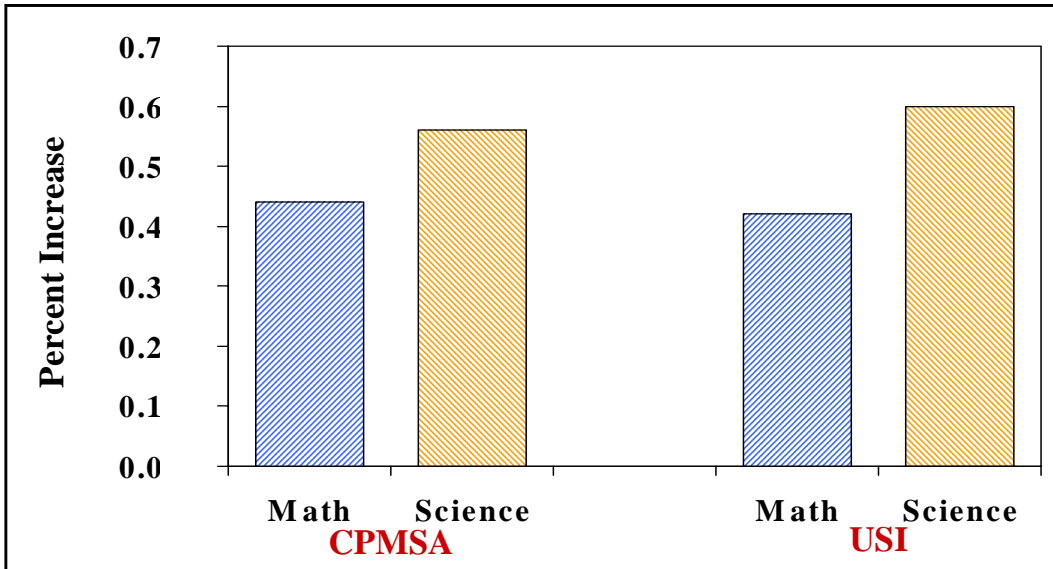


Exhibit 2
INCREASED PERCENTAGE OF PASSING RATES
IN HIGHER ORDER MATH AND SCIENCE COURSES

