

**Data & Evaluation Breakout Session 2:  
Longitudinal Data Analysis**

**PI/PD Leadership  
Institute**

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# Overview

- **Brief history of SI-related data collections**
- **Challenges to designing and collecting online data**
  - NSF/Westat
  - SI projects
- **Key findings**
  - CDE
  - USP Activity Matrix
- **Value of collection activities**
  - NSF/Westat
  - SI projects

# Data Collections for SI Programs

- **Core Data Elements (CDE)**
  - Combination of process and outcome data
  - Trend data over a 5-year period
  - Short-term headaches; substantial long-term benefits
- **Annual Report**
  - Narrative linked to the six drivers
  - Informal link to data from the CDE
- **USP Activity Matrix**
  - Designed to bridge the gap between CDE and Annual Report
  - Tool for exploring the relationship between project activities and student outcomes
  - Inventory of strategies conducted by the urban Systemic Initiatives
  - Close-ended—with limited narrative (searchable)

# Challenges: NSF/Westat

- **Anticipating and prioritizing long-term data needs**
- **Minimizing response burden—while maximizing NSF’s capacity to systematically address a wide range of stakeholder needs**
- **Maintaining consistent data items and definitions over time—that is, getting it right the first (or second) time**
- **Developing consistent and clear instructions for complex items**
- **Providing time and accurate feedback and technical assistance**
- **Developing a single instrument that pertains to all project types and reporting capabilities**
- **Allowing projects enough time to complete all items—while meeting NSF’s annual reporting requirements**
- **Maximizing the use of student achievement data**
- **Turnover among NSF staff and respondents**
- **Building validations into the system**
- **Validating data—within and across years**

# Challenges: SI Projects

- **Response burden**
- **Difficulty obtaining requested data**
  - Archived school-level data
  - Data maintained in system as percentages (as opposed to numbers)
  - Competing priorities—e.g., staff with access to data already have other time-sensitive deadlines
  - Requested data not available until after collection closes
- **Difficulty entering a large volume of data**
- **Adjusting to changes in items and/or underlying definitions over time**
- **Using stable and consistent data collection methods over time**
- **Staff turnover**
- **Anything else?**

## **Key Findings: *Core Data Elements* (*Schools, Students, and Funding*)**

- **Number of schools reached in any way increased over time**
  - From 807 schools in SY 1999-00 to 4,452 schools by SY 2002-03
- **Middle schools had highest proportion of schools that met the criteria for significant USP participation**
  - 94.6 percent for Cohort 1 middle schools in SY 2002-03
- **Number of students enrolled in schools that met criteria for USP participation for 3 or more years increased over time**
  - From 447,531 students in SY 1999-00 to 1,829,256 in SY 2002-03
- **Average proportion of NSF funds spent on professional development increased over time**
  - Nearly half of NSF funds were devoted to professional development by SY 2002-2003

## **Key Findings: *Core Data Elements* (*Professional Development*)**

- **Number of K-12 teachers receiving USP-sponsored professional development increased over time**
  - From 11,707 teachers in SY 1999-00 to 81,853 in SY 2002-2003
  - Proportion of teachers receiving professional development fluctuated with addition of new projects
- **Proportion of teachers receiving 60 or more hours of USP-sponsored professional development declined steadily over time**
  - From 30 percent in SY 1999-00 to 18 percent in SY 2002-03
- **Number of K-12 administrators receiving USP-sponsored professional development increased over time**
  - From 1,439 administrators in SY 1999-00 to 5,830 in SY 2002-03

# Key Findings: *Core Data Elements* (*Student Outcomes*)

- **In most subjects, the number of students enrolled in AP courses increased steadily over time**
  - Annual increases also occurred within each cohort
  - Proportion of AP tests with score of 3 or more was consistent over time
- **Although student gains on statewide assessment were modest over time, the magnitude of growth (especially for mathematics assessments) was noteworthy given the relatively low per-pupil expenditures for the urban Systemic Initiatives**
  - The mean effect-size estimate was 0.06 for mathematics and 0.03 for science—both of which were statistically significant
  - The effect-size estimates represent the annual growth rate of student performance on mathematics and science assessments without any regard to the initial status on those assessments

## **Key Findings: *USP Activity Matrix* (*Most Prominent SI-related Activities*)**

- **Conduct or arrange content/pedagogy summer institutes for teachers**
- **Provide incentives for teachers to participate in professional development**
- **Develop or adopt standards-based curricula/materials**
- **IHE faculty provide professional development courses to teachers**
- **Promote the use of technology applications**
- **Develop/demonstrate model lessons (e.g., best practices, inquiry-based lessons)**
- **Develop/adopt standards-based assessments (or align local assessments with statewide assessments)**
- **Maintain district-based lead teachers**
- **Help teachers analyze and interpret assessment data (e.g., to assess their own instructional practices)**

## Key Findings: *USP Activity Matrix* (*Student Achievement*)

- **Two strategies for mathematics had a positive and statistically significant effect on student performance on *mathematics* assessments**
  - *Math Broad-based Support Strategies with Institutions of Higher Education*
  - *Math Curriculum, Instruction and Certification Policies*
- **None of the implementation strategies or policies for *science* included in the *USP Activity Matrix* could be used to explain the variance in growth on science assessments**

# Value: NSF

- **Enhanced capacity to monitor program and project-specific trends**
- **Consistent method for examining links between SI-related activities and student achievement**
- **Enhanced capacity to assess and document the implementation, scale-up, and impact of overall SI program and individual projects**
- **Enhanced capacity to address questions from congressional staff in a timely manner**
  - Annual reports
  - Searchable cornerstone text for NSF staff
- **Program officers more knowledgeable about using data**



**Value: Projects**

