Two Programs in One? Designing a Mutually-Beneficial Evaluation in STEM Education Professional Development

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Introduction

Since 2004, over 1,500 faculty from across the nation have been inspired and empowered to transform learning and teaching through training at Summer Institutes (SI's). The Institutes model the scientific teaching principles of active learning, assessment, and inclusive teaching. Over an estimated 100,000 students have been reached through these faculty's practices.

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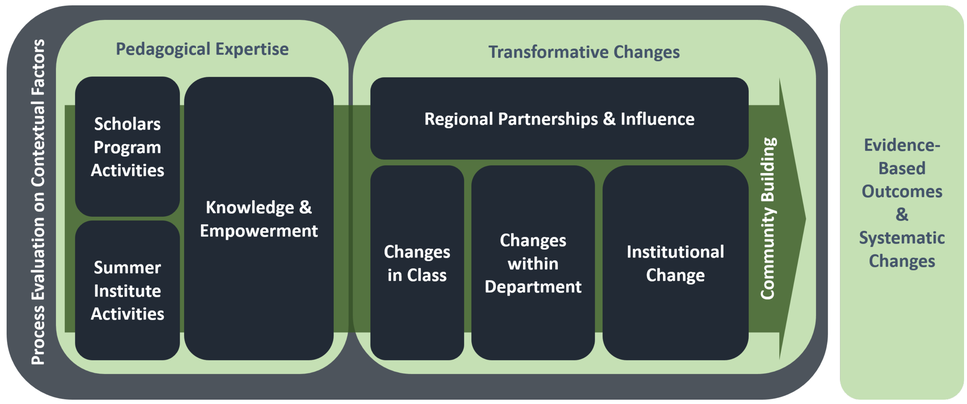
Building on this expertise, we extend the reach of training opportunities to include:

1. A new postdoctoral teaching scholars program
2. Summer Institutes targeted to instructors from teaching-intensive institutions and community colleges

The Program: How to Evaluate?

The flow diagram depicts the program design, which strongly impacts our evaluation strategy. The program model demonstrates a convergence between strands. Given analogous goals and impacts, both seek to utilize community-building and promote transformative changes at institutions. Corresponding contextual factors and challenges affect implementation of both parts, as well.

This sets the stage for a combined evaluation design, in which data collection can be simplified and leveraged to our advantage, rather than two isolated evaluations.



Preliminary Results

In 2016, five regional Summer Institutes were held.

- Survey data was collected from 168 attendees and 49 facilitators.
- At the three SI's that focused on community colleges and teaching institutions, 41.9% of participants were from the target population.
- The postdoctoral scholars functioned as facilitators, and are therefore included in these results.

During the 2015-16 academic year, the postdoctoral scholars taught seven introductory courses, reaching a total of 490 students.

Mathematics Courses at Yale & Physics Courses at Yale

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Survey data was collected from 210 students exposed to scholars teaching practices.

Summer Institute Core Elements	**Participants:** The SI enabled/ prepared me in this area	**Facilitators:** I have used information presented at the SI in this area recently
Knowledge	5.1	5.3
Attitude/ Empowerment	5.4	5.6
Practice/ Implementation	5.3	5.4
Leadership/ Community	5.0	4.6

Means presented from responses on likert-type scale:

1 (Strongly Disagree) to 6 (Strongly Agree)

Process Factors Reported by Both SI Participants and Facilitators

Top Challenges	Top Supports
• Time available to prepare for class	• The Summer Institutes community
• Time during class to cover material	• Relationships with Colleagues
• Student expectations at my institution	• Comfort level for developing activities
• Monetary resources available	• Knowledge of where to find additional materials and resources

Students Taught by Postdoctoral Scholars: Survey Responses

Compared to other classes you have taken, this class was...

Less — About the Same — More

Supportive

5.3

1 — 7

Percent of Students Responding Agree or Strongly Agree

- I would recommend this instructor: 81%

This instructor...

- Creates an inclusive environment where all students can learn: 93%
- Helps me think about areas I can improve: 73%
- Makes me feel encouraged to take more science-related courses: 73%

Percent of SI Participants Responding Agree or Strongly Agree

- I could relate the examples to my own experiences: 86%
- Collaboration and networking were encouraged between attendees: 92%

Design Benefits: Combined Evaluation

Efficiency and Time Savings in Instrument Development

- Parallel data collection tools
- Aggregation and comparison of results

Reporting and Interpretation Enhanced

- Local implementation of postdoctoral scholars program > Supplemental qualitative data
- Larger participant base at the SI's > Statistical analysis

Multiple Perspectives to Inform Program Design and Drive Program Improvement

- With insight gained into an overlapping target population, results can be generalized across prongs of the program to trigger revisions to future evaluation plans, improved survey items, and programmatic changes

Conclusions

Program designers understood that the two parts of this program could influence one another and add value by being conducted together. Our evaluation design provides the opportunity to engage stakeholders, recognize areas for program improvement that may span across project components, and encourage evaluation users to see the big picture in interpreting results.

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