Four Perspectives on the Nature and Effectiveness of STEM-Focused Schools

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August 6, 2014

Presentation for the DRK-12 PI meeting, Washington, DC

Based on work supported by the National Science Foundation
History: Emergences of *Selective* Science and Math Schools for Talented Students

- U.S. public high schools have taken a comprehensive approach with the goal of serving all students, whatever their goals.

- Around turn of 20th century, some states and school districts created selective public schools focused on science and math.

- Rigorous admissions requirements, usually a competitive exam.

- Multiple models
  - Local
  - Residential
  - School-within-a-school
Representation in STEM Majors and Careers

- Total employment in science and engineering occupations is growing at a faster rate than employment in other occupations.
- Hispanics, African Americans and Native Americans comprise 26% of the U.S. population but just 10% of workers in science and engineering occupations.
- Among college-educated members of the science and engineering workforce, 6% are African American and 5% are Hispanic.
- Women comprise half of the college-educated workforce but just 13% of the engineering and 25% of the computer and mathematical sciences portions of this workforce.
New Development: *Inclusive* STEM-focused High Schools (ISHSs)

- **Goal**: Increase minority participation in STEM.
- **Have** “open” admissions, fewer requirements.
- **Provide more intensive STEM learning experiences with goal of giving their graduates the foundation for a STEM college major**
STEM High Schools: Specialized STEM Secondary Schools in the U.S. (Means et al., 2008)

- Used NCSSSMT and Gates Foundation records to identify STEM schools
- Survey of 203 schools (66% response rate)
- 55% of responding schools identified themselves as inclusive STEM-focused schools
- Most were stand-alone schools, but 38% were “school-within-a-school” and 20% were charter schools.
- Most were established after 1998
Inclusive STEM High Schools as a Strategy for Increasing Representation

- Students and their families choose to attend inclusive STEM schools.
- Students are selected primarily on the basis of interest; does not use examination-based entry; either most applicants are accepted or if oversubscribed, students are selected through some form of lottery (though representation may be a factor).
- Core program prepares students for postsecondary STEM majors.
More About ISHSs

- Typically small in size.
- Many are recently established either as stand-alone small schools or as a school-within-a-school in a larger high school.
- New ISHSs often start with a 9th grade class and then add one class a year.
- ISHS vary in whether or not they have a curriculum focus, emphasis on integrating STEM subjects, or a particular instructional philosophy.

- Some ISHSs
  - have strong links to community partners
  - have elements of career technical education
  - are also Early College High Schools
Three types of specialized schools

1. Selective STEM schools
   - Mainly high schools that enroll small numbers of highly talented and motivated students

2. Inclusive STEM schools
   - Organized around STEM disciplines but without selective admissions criteria

3. STEM-focused CTE schools
   - Mainly high schools, aim to foster engagement and to prepare students for STEM-related careers
Panel Presentations

- Project Goals and Research Questions
- School Contexts
- Findings: Essential Features of These Schools
- Preliminary Findings: Impacts
- Panel Order
  - Melanie LaForce, University of Chicago
    STEM School Study
  - Sharon Lynch, George Washington University
    Opportunity Structures for Preparation and Inspiration (OSPrI):
    Understanding Inclusive STEM High Schools
  - Steve Schnieder, WestEd
    Study of Selective STEM Specialty Schools
  - Barbara Means, SRI Education
    iSTEM: A Multi-state Longitudinal Study of the Effectiveness of Inclusive
    STEM High Schools