Redesigned High Schools for Transformed STEM Learning

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Evaluation of STEM Schools

- NSF-funded evaluation of 10 STEM schools in North Carolina

- All are inclusive – but three different models
  - Re-designed high schools
  - Early College High Schools
  - New Tech Network

- Do innovative learning environments help students become active STEM learners with the capacity to think critically and solve real-world problems?
STEM schools

- Supported by North Carolina New Schools (NCNS), a private-public partnership

- Small schools

- Guiding principles
  - Personalized instruction
  - Emphasize connections across fields
  - Collaborative group work
  - All students prepared for college/careers
Staff in all schools believe that project-based learning and personalized student-teacher interactions are key elements of their reform.

Analyses show schools had consistently positive ratings in classroom culture and student-teacher relationships.

Analyses show schools varied in their use of project-based learning – some project-based learning was not rigorous.

Student survey shows school differences in attitudes about STEM.
Student STEM attitudes, by school

- I would choose to take more STEM classes
- I understand how STEM is used in careers
- My school has made me more interested in a STEM career
- I will use STEM after high school

Percentage of students
Why so much variation in STEM attitudes?

- Schools chose to be “STEM schools”
  - Each school may define it differently
  - Each may have had different motivations for choosing STEM

- Sustainability challenges
  - Leadership changes and teacher turnover
  - Challenges in forming partnerships with businesses and universities
  - Changes in funding/support from external sources
Why so much variation in student attitudes?

- **Instructional factors**
  - Teacher experience
  - Teacher professional development
  - Rigor of project-based learning
  - Use of technology

- **Student factors**
  - Poverty level
  - Student and parent motivation
STEM schools do have an impact

- Compared to similar students in traditional high schools, students in STEM schools are more likely to report that
  - They were more interested in pursuing STEM courses
  - They believed their school was helping them develop skills and understand steps needed to pursue college and careers.

- Compared to matched students in traditional high schools, students in STEM schools
  - Had higher rates of passing advanced math and science classes
  - Were more likely to take classes for potential college credit
  - Were more likely to graduate