Fostering Achievement Seminar

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Special Guest: Felicia Moore (TC)
Bridge Program
Developing Teacher Leaders in Math and Science for New York City Public Schools

A collaborative project of Barnard College and Teachers College supported by the Dimon Foundation.
Program Goals

- Expand pipeline for math/science educators at high need elementary, middle, and high schools

  ➢ Recruit students into science/math education early in their undergraduate careers

- Mentor Barnard students to become teacher leaders in math/science in New York City Public Schools:

  ➢ Support graduates of the Barnard Education Program through completion of MA degree in mathematics or science education at Teachers College

  ➢ Prepare graduates to become Teacher-Leaders in high need public schools through ongoing mentoring and professional development with Barnard and Teachers College faculty.
Program Activities

- Introduce undergraduates to careers in Science and Math Education
- Host annual Speaker Series on contemporary topics in math and science
- Offer courses that partner with public school educators using NYC as a resource for teaching math and science
- Invite Teachers College faculty to guest lecture in Barnard courses
- Include students in activities and professional development seminars at TC
- Provide research opportunities with BC and TC faculty
- Select eligible Barnard students to become Teacher-Leader Fellows, receive financial support to complete certification at BC and move on to Masters at TC
Teacher-Leader Fellows

- BC sophomores apply to become Teacher-Leader Fellows.

- Fellows eligible for funded 9th semester option (to student teach, obtain certification, graduate from BC mid-year, and begin TC master’s program in spring semester.)

- Fellows eligible for paid internship to work with TC Math/Science faculty on in-service, research, and community outreach programs.

- Fellows participate in orientation sessions to facilitate transition from BC to TC graduate programs.

- Fellows enter MA programs in Curriculum & Teaching, Science Education, or Math Education and qualify for professional certification as Math or Science middle and secondary school teachers.
Graduates as Teacher-Leaders in Public Schools

Become “turnkey” teachers who can lead innovative educational activities in Math/Science curriculum and mentor peer colleagues in their schools through:

- Teacher-Leader Support group for ongoing leadership development and mentoring

- Research, publications, and conference presentations with BC/TC faculty to develop and disseminate a model for preparing teacher leaders in math and science for high need schools

- Professional development grants of $5000 awarded to eligible program participants with at least 3 years of teaching in NYC public schools and master’s from TC

- Serve on project advisory board, alongside principals from participating schools and Barnard faculty in mathematics and the sciences, to guide project and support new grants to maintain project.
Science in the City
Math and the City
Course Design...

1. Collaborate in practical partnerships
   - school/museum/university
   - pre/inservice teachers

2. Use city/museum as resource for science and mathematics teaching

3. Build on what students/teachers bring to teaching and learning

4. Use evidence to assess student learning
Three contexts for learning...

Requirements

- Attend weekly seminar
- Attend 2 evening and 1 weekend seminar at the museum
- Complete 30 hours of fieldwork in an elementary or middle-level science/math classroom
- Co-plan a field trip to the museum with the students
Teacher learning cycle...
Doing Something Scientific...
Exploring mathematical concepts...
Play-debrief-replay...

Playing...

Planning for play in the classroom...
What mathematical concept is seen here?
Learning Science to Teach Science

Observing Properties of Rocks...

Making Inferences...
Teaching Science to Learn Science...

In the classroom...  In the city...
Teaching Math to Learn Math...

In the classroom...  In the city...
Math Field Trips

*Make mathematics “real” by connecting concepts to the familiar.*

- Find math in the local environment
- Use educational programs in local institutions to support math instruction
  - The Cathedral of St. John the Divine
  - New York Hall of Science
Evaluating evidence of student learning

- Engagement and enthusiasm for science/math
- Making real-life connections
- Completing performance tasks
- Explaining observations

“Allowing students to participate with their cultural and own world examples really sparked the discussion in the class as well as the students’ attention to the lesson.”
Becoming Reflective Teachers

Participant reflections

Mathematics/Science
Teaching Methods
Their Own Teacher Identity
Environment
Students

Tools for Reflection

• Team Discussions
• Journals and Math Notebooks
• Technology
  • Video Interactions for Teaching and Learning (VITAL)
  • Wiki Scholars
What worked well?

Students Said: 

Teachers Said: 


What worked well?

**Students Said:**

- Reflecting with others
- Hands-on experiences in a real classroom
- Having the support of experienced teachers as they practice teaching
- Having opportunities to observe in schools
- Taking trips (formal and informal) to look at math in our environment

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**Teachers Said:**
- Reflecting with others
- Planning with others
- Having extra help in the classroom
- Exploring concepts as a group
- Thinking about what mathematical knowledge students bring
- Taking math lessons beyond the classroom walls
Challenges for elementary science

- Science marginalized in elementary schools
  - Little recognition of efforts to teach science
  - Low status compared to literacy and math

Challenges for k-8 mathematics

- Emphasis on high stakes testing
  - Pressure to “cover” material at a fast pace
Shared challenges for effective math/science instruction:

- Elementary teachers often lack adequate content knowledge
- Limited materials
- Lack of professional development
- Limited time
- NYC reforms infuse materials only
  - Teachers still need support in content and pedagogy
  - Set curricula can limit creativity and ownership
  - Teachers need support adapting curricula to their students
Participants say...

- “I liked that the seminar combined two things I really enjoy—science and teaching. I liked that there were “real” teachers in the class. I think they brought a different perspective and made discussion interesting and informative.”

- As a pre-service teacher, I am responsible for observing my students...Teaching is subject to review and modification in response to current information, just as science and scientific theories are constantly subject to tests to determine their validity.”
Questions:

- How can we inform undergraduates about these opportunities?

- How can we best work with you, our colleagues in sciences and mathematics?

- How might we improve the program?

- Would you be willing to serve on our advisory board?