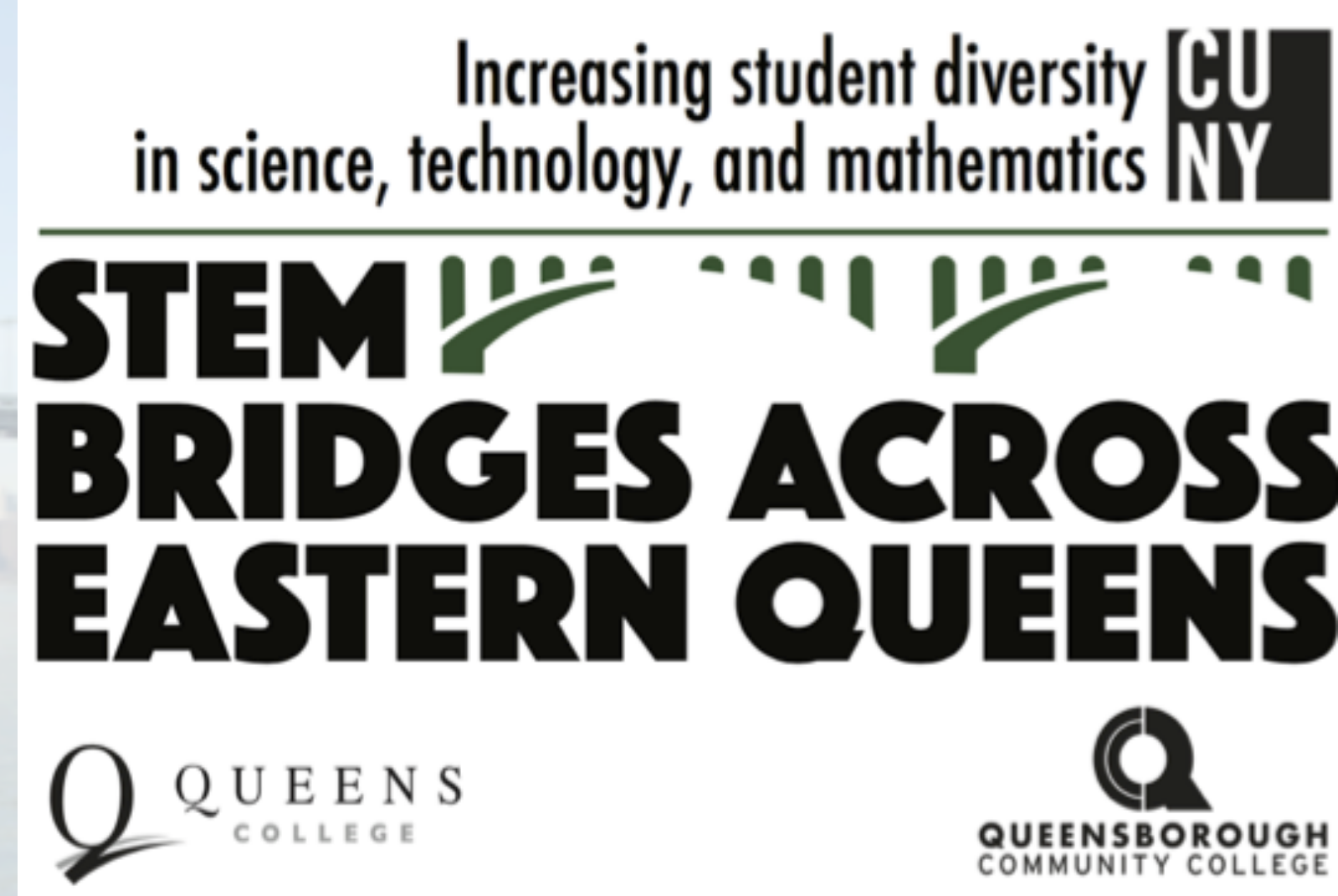


# Using Peer Mentors to Enhance Performance in STEM

## Labs: First Steps and Initial Findings<sup>1</sup>

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### Background

Improving participation in STEM by underrepresented groups is essential, not only from a social justice standpoint, but also because diversity adds value to the scientific process—and, more broadly, to any organization—by stimulating innovation.

To this end, Queens College (QC) recently partnered with Queensborough Community College (QCC), our largest feeder institution, on a five year federally-funded STEM grant with these primary goals:

#### 1 Improve Access:

Re-design 20 STEM-landing courses (up to 7,000 students annually in treatment-group courses)

#### 2 Improve Learning:

Develop “learning collectives” where peers mentor students

#### 3 Bridge:

Articulation agreements and assessment processes for all STEM majors, QCC → QC

#### Outcomes:

(a) graduate more Hispanic & low-income students

(b) develop articulation agreements for QCC-to-QC transfer

This poster highlights the process of peer mentoring in development of learning collectives (aim 2) (Treisman, 1992).

### Peer Mentoring

Mentoring should not to be equated with tutoring rather, mentors should be a bridge between students and faculty helping students develop good learning practices.

Improved academic outcomes in landing courses,  
Improved retention in STEM  
Increased rate of 4-yr graduation in STEM majors

Students are exposed to improved courses, peer support and mentoring

Trained students serve as peer mentors and discussion leaders

Peer mentors participate in classroom activities

#### Improve Learning

Develop Peer-led Learning Collectives

### Peer Mentor Training & Support

#### Pedagogy training by Science educators

- Primary training before classes began
- Ongoing pedagogical training during semester for Peer mentors
- Open discussion of Peer Mentors to explore implementation of pedagogical practices

#### Content sessions with course faculty

- Discipline specific
- Discussion of key concepts and misconceptions peer mentors may face with students

#### Project coordinator interaction

- Peer mentors have resources outside of course faculty to discuss issues and questions
- Coordinators created Study Hall spaces for Peer Mentors to meet with students.

### Initial Findings

There was a major difference between peer mentors from the two institutions, specifically in their commitment to the project and the process of peer mentoring in general. While QC students were less committed and involved with the project from the outset, their QCC counterparts took their participation far more seriously. We believe that this difference arose because of an important difference in the two peer mentor selection processes: QC mentors, for the most part, applied in response to an advertisement placed around campus, QCC students were nominated by biology and chemistry faculty. Not only did this mean that the latter group was primarily selected on the basis of personal experience rather than information provided on a sterile application form, it also meant the community college mentors had an involvement and personal relationship with the faculty involved with the project.

Employing QR codes to log student office hour interactions revealed more than 200 student visits to peer mentor office hours. Preliminary statistical analyses indicate in both QC biology and chemistry courses, students in lab sections in which peer mentors were present were less likely to withdraw from the course. In addition, it appears that there were higher scores on the biology final among students who had been exposed to peer mentors.

### Future Directions and Limitations

#### Quantitative analysis

- Future course selections
- Course grades in upper level courses
- Student’s major declarations
- Analysis aims to determine the extent to which enhanced academic outcomes occur in all student groups or vary between demographic subgroups: race/ethnicity, gender, socioeconomic status

#### Peer Mentor Use—

- The first year was a developmental process to determine the roles of Peer Mentors, though we did find spontaneous emergence of student groups led by peer mentors
- Second year focus will include systematic development of collaborative learning groups by Peer Mentors to better establish and develop functioning learning collectives

### Peer Mentor – Student Interactions

While tutors typically answer specific, content-based questions and provide review session training, our mentors were trained to become learning facilitators that should act as the “more knowledgeable others” highlighted in Vygotsky’s zone of proximal development.



They should facilitate students’ movement from actual development to a more advanced level of proximal development. Then, too, mentors were to act as older undergraduates who had learned “the ropes” around campus and could assist younger undergraduates navigate the various complex systems found in large urban higher education institutions.

Having navigated these systems themselves quite recently, peer mentors were ideal guides for the relatively new undergraduates enrolled in introductory biology and/or chemistry courses.

### STEM Bridges Across Eastern Queens Team

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### Resources

Treisman, U. (1992). Studying students studying calculus: A look at the lives of minority mathematics students in college. *College Mathematics Journal*, 23, 5, 362-372.)

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