

Seeding the Future: STEM Learning through Social Entrepreneurship, Social Justice, and 21st Century Urban Agriculture

Michael Barnett

Boston College
Lynch School of Education
Innovations in Urban Science
Education Lab

barnetge@bc.edu
<http://iuse.bc.edu>



National Science Foundation
WHERE DISCOVERIES BEGIN

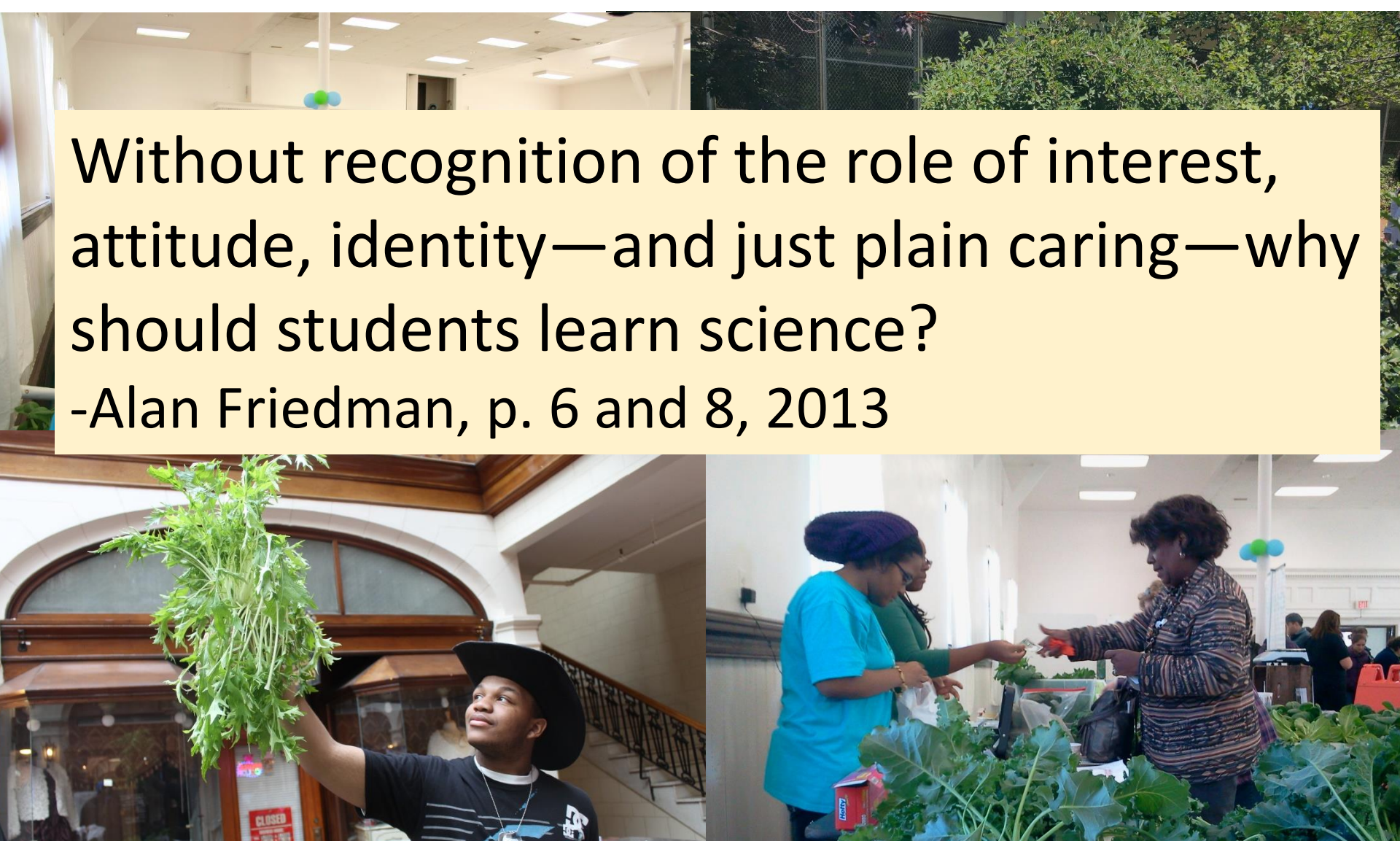


A Question?

So what gets people/youth excited about science?



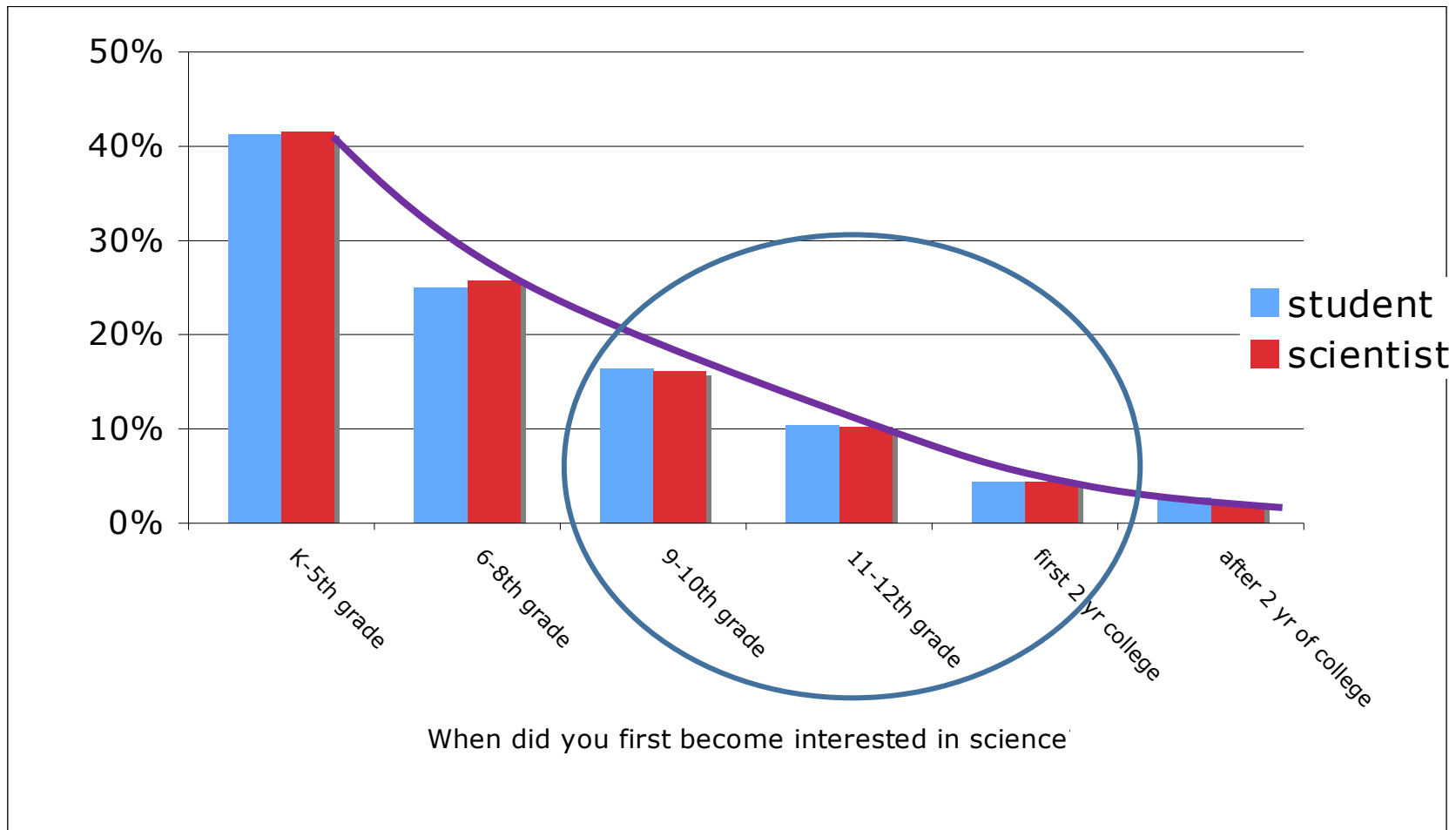
So what gets people/youth excited about science? When does it happen?



Without recognition of the role of interest, attitude, identity—and just plain caring—why should students learn science?

-Alan Friedman, p. 6 and 8, 2013

When do scientists and graduate students say they first became interested “science”?

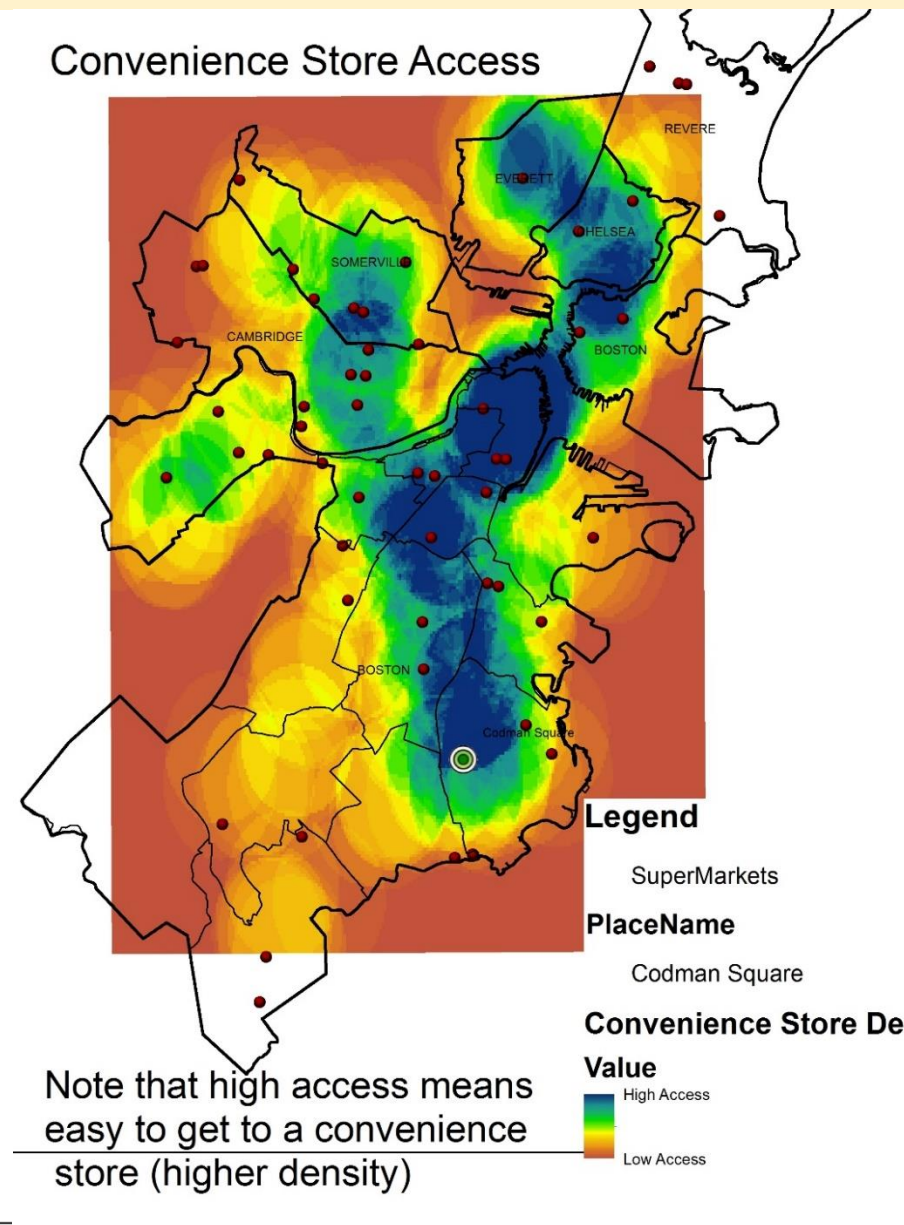
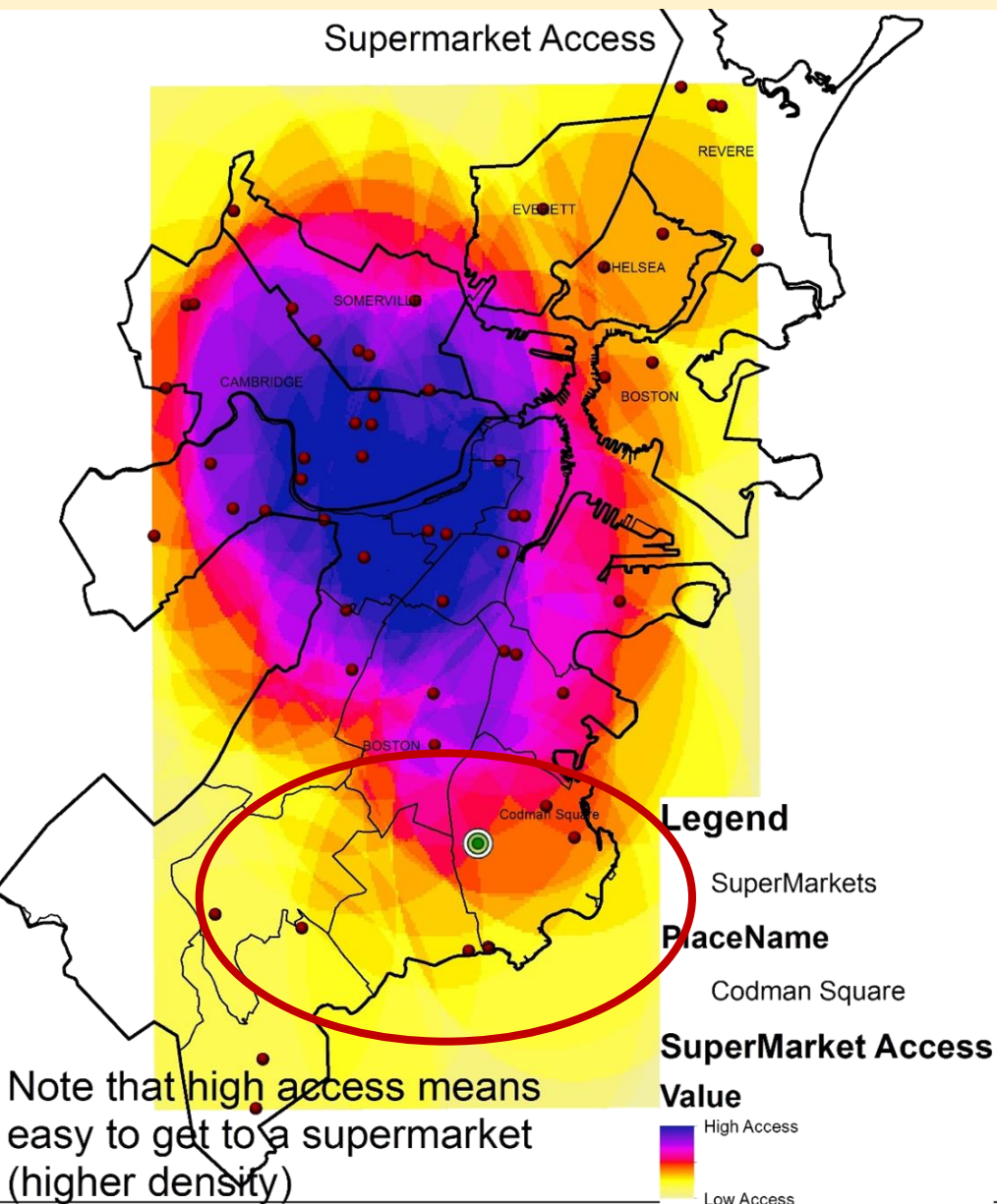


Social Justice + Social Entrepreneurship + STEM

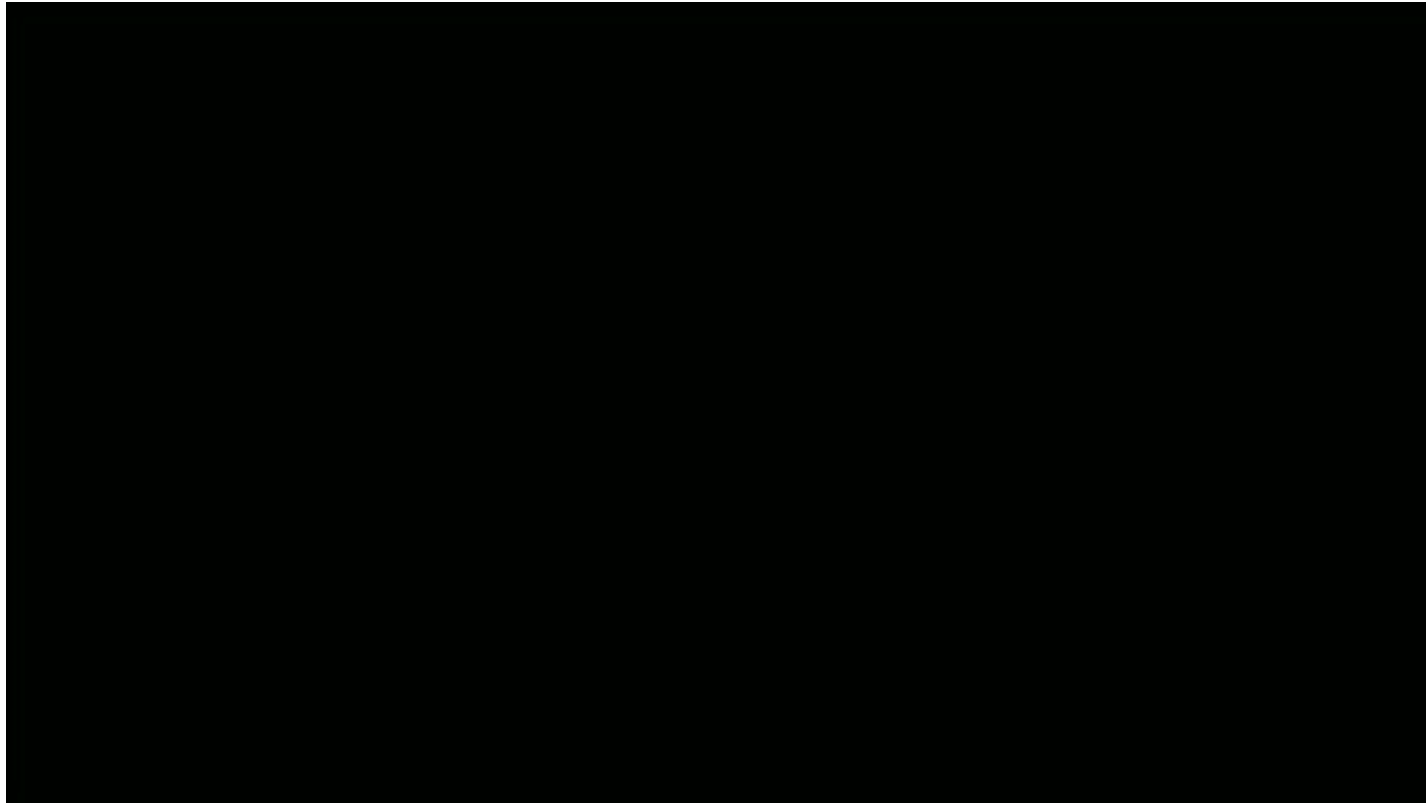
- Build STEM around issues that matter to students
- Students = empowered
 - *learning that aims to rectify social injustices* (Chubbuck & Zembylas, 2008; Nieto & Bode, 2008)
- scientific investigations + social action
 - *academic empowerment alongside political empowerment* (Dimick, 2012).
- Youth want to make a sustainable and real difference their communities and schools
(Zhang & Barnett, Mark, Blustein, Barnett, et al., 2013)



Food Justice: A Problem in Need for a Social Entrepreneurship Solution



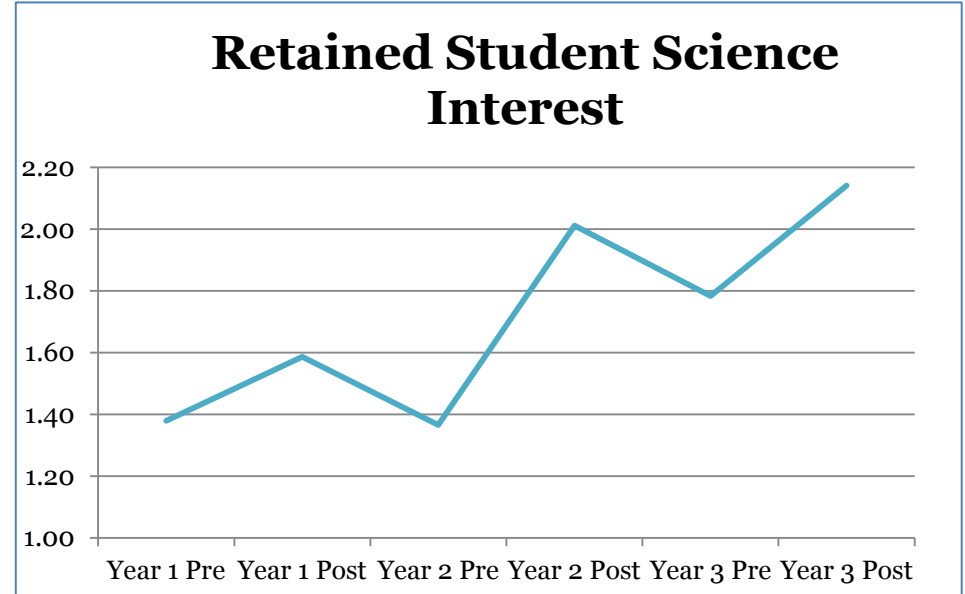
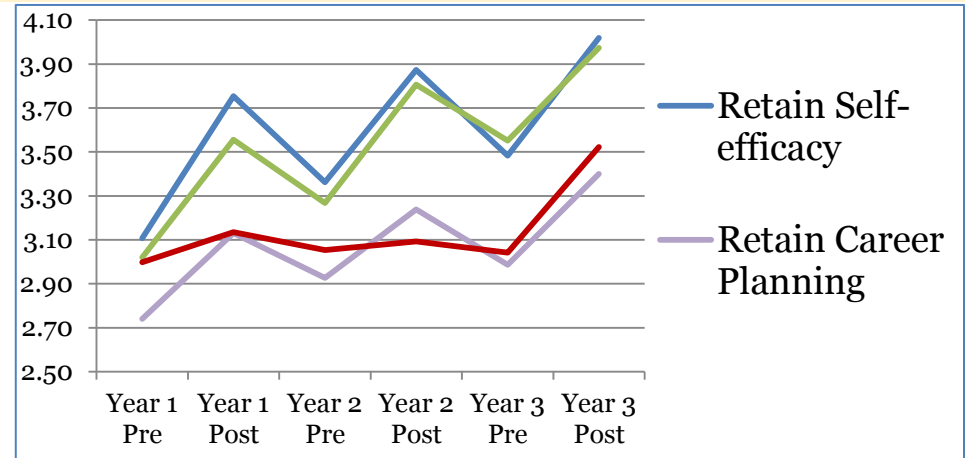
Improving the Community



High school training middle school youth with special needs to build hydroponic systems. The middle school youth will sell their produce to a local bakery that provides job training for homeless individuals

Takes time and lots of bumps along the way

- A trigger interest effect that grows over time... in bits and starts
- It takes 2 years to re-spark interest
- It often takes 3 years to get students feeling like they can do “this” – STEM career



$$(\hat{\beta}_{Time} = .15, t = 11.73, p = .98).$$

Partners – Key to impact + Scale

- Public, Private, Non-Profits
 - City of Boston – Mayors Office
 - Los Angeles Mayor's Office
 - Boston Public Schools – OELL office
 - **MentorNet**
 - **American Hydroponics**
 - **GYOStuff**
 - **General Hydroponics**
 - **Wicked Device, LLC**
 - **Placeways, LLC**
 - *Codman Square Development Corporation*
 - *Salvation Army*
 - *Project LEAH (train high school to teach/mentor younger students)*
 - *STEM Garden Institute*
 - Center for Urban Resilience and Sustainability – LMU-LA
 - **Helical Systems**
 - **uFactory**
 - Massachusetts Bay Community College
 - *Groundworks USA*
 - **MassRobotics**
 - *The Daily Table*
- Common Core Goals
 - Get youth interested and excited about science
 - Create pathways for youth



True trust: Picture from standing on the 6th floor ledge of Boston City Hall



Thank you and the team!

- Collaborating Faculty and Partners
 - Dr. David Blustein – LSOE – Counseling Psychology
 - Ms. Catherine Wong – Urban Outreach
 - Dr. Eric Strauss – Urban Ecologist
 - Dr. Alan Kafka – Earth and Environmental Science
 - Dr. Elizabeth Bagnani – CSOM – Finance
 - Dr. Laura Foote – CSOM – Social Entrepreneurship
 - Dr. Laura O'Dwyer – LSOE- Educational Research/Measurement
- Undergraduate Students
 - Simon Carroll – Physics
 - Chris Aguiar - Biology
 - **Sterline Desjardins – Junior in Nursing (started with us in 9th grade)**
 - Jun Lin – Marketing/Finance
 - Christian Ko – Economics
 - Maren Wilson – Elementary Education
- Graduate Students
 - Rajeev Rupani – Science Education
 - Amy Sejeran – Statistics (Ed Measurement)
 - Chad Olle – Career Education
 - Alice Connors-Kelgren – Career Education
 - Paul Hsu – Educational Technology (Literacy/Robotics/Electronics – Lead)
 - Anne Vera-Cruz – Science Education & Organizational Leadership (China – lead)
 - Paul Madden – Math Education (Math lead)
 - Arunima Sengupta – Science Education
 - Amie Patchen – Informal Science Education (OST lead)



National Science Foundation
WHERE DISCOVERIES BEGIN

