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

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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”?

When did you first become interested in science?

Percent

K-5th grade 6-8th grade 9-10th grade 11-12th grade first 2 yr college after 2 yr of college

When did you first become interested in 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 in their communities and schools (Zhang & Barnett, Mark, Blustein, Barnett, et al., 2013)
Food Justice: A Problem in Need for a Social Entrepreneurship Solution

Supermarket Access

Convenience Store Access

Note that high access means easy to get to a supermarket (higher density)

Note that high access means easy to get to a convenience store (higher density)
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

\[
\begin{align*}
\hat{\beta}_{\text{Time}} &= .15, \\
t &= 11.73, \\
p &= .98.
\end{align*}
\]
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)