Thinking Global, Educating Local:
Introduction to Sustainability Education

Tuesday, March 12
3:30 - 4:30pm

TEACHERS COLLEGE
COLUMBIA UNIVERSITY
A Graduate School of Education, Health & Psychology
Sustainability Webinar Series
Spring 2019

Tuesday, March 12th, 3:30 - 4:30 p.m.
Thinking Global, Educating Local:
An Introduction to Sustainability Education

Monday, April 8th, 3:30 - 4:30 p.m.
Educators Creating a Climate for Change

Tuesday, May 7th, 3:30 - 4:30 p.m.
School Climate and Student Learning:
Thinking Outside the Box.

Monday, June 10th, 3:30 - 4:30 p.m.
Food Matters: Teaching Ecological Sustainability Through What We Eat

For more information, go to
www.tc.columbia.edu/sustainability
Thinking Global, Educating Local

Dr. Oren Pizmony-Levy
op2183@tc.columbia.edu
What do “sustainability” and “sustainable development” mean to you?

Type your definition in the textbox
How NYC educators define “sustainability” and “sustainable development”

• Fall 2016 Sustainability Plan Survey
• Sample = 1,418 responses
• Data analysis
Examples

• “Ensuring a good recycling, reusing program, to impart knowledge on students and staff on conserving energy…” (ID 308)

• “…To always act in the best interests of protecting existing resources and extending the longevity of the planets re-usable resources…” (ID 404)
Examples

• “It means civic responsibility to our planet!” (ID 1025)

• “To be "sustainable" is to have endless viability - not only as a society or a physical city, but as an integrated ecosystem, working in tandem with the world around us” (ID 1075)
Common themes in definitions of “sustainable development”

- First person (I/we/our): 42%
- 3Rs = Reduce reuse recycle: 31%
- Environment = Environmental focus: 30%
- Waste = Prevent waste: 25%
- School = Place: school level: 18%
- Saving = Protect resources: 17%
- Global/Planet = Place: global: 14%
- Footprint = Minimize footprint: 13%
- Knowledge = Knowledge transmission: 12%
- Future = Future: 11%
- Behaviors = Actions behaviors practices: 10%
Common themes in definitions of “sustainable development”
Sustainable Development

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

(Brundtland Report 1987)
Sustainable Development

- Social
  - Bearable
  - Equitable
- Environment
- Economic
  - Viable
Sustainable Development

Environment

Society

Economy
Short History of Environmental & Sustainability Education
Rachel Carson

Silent Spring

The classic that launched the environmental movement

Rachel Carson

Introduction by Linda Lear / Afterword by Edward O. Wilson
“Earthrise” taken in 1968 by the crew of the Apollo 8 mission
"The Blue Marble" is a famous photograph taken in 1972 by the crew of the Apollo 17
The emergence of global environmentalism

Figure 1. Cumulative Numbers of Five National Environmental Activities, 1900 to 1988

Environmental & Sustainability Education: Milestones

• **1970**: International Working Meeting on Environmental Education and the School Curricula (Nevada, USA)
• **1975**: International Workshop on Environmental Education (Belgrade)
• **1977**: Intergovernmental Conference on Environmental Education (Tbilisi)
• **1987**: International Congress for International Strategy for Action in Environmental Education for the 1990s (Moscow)
Environmental & Sustainability Education: Milestones

- **1992:** UN Conference on Environment and Development (Rio de Janeiro)
  - Agenda 21 is published
- **1997:** International Conference on Environment and Society (Thessaloniki)
- **2002:** World Summit on Sustainable Development (Johannesburg)
- **2005-2014:** UN Decade of Education for Sustainable Development
Environmental & Sustainability Education: Milestones

- **2007** - International Conference on Environmental Education (Ahmedabad)
- **2012** - UN Conference on Sustainable Development (Rio de Janeiro)
- **2015** - UN Sustainable Development Goals
Environmental & Sustainability Education: Milestones

1992

2002

2012
“There is a need to increase people’s sensitivity to, and involvement in, finding solutions for environment and development problems. Education can give people the environmental and ethical awareness, values and attitudes, skills and behavior needed for sustainable development. To do this, education needs to explain not only the physical and biological environment, but the socio-economic environment and human development.”
Environmental & Sustainability Education: Going Global

Percent of social studies textbooks with any discussion of the environment

Environmental & Sustainability Education: Going Global
Environmental & Sustainability Education: Going Global

Figure 4.1
Placement of environmental topics in the school curriculum

Source: OECD PISA 2006 Database, Table A.1.
ScatLink http://dx.doi.org/10.1787/562235784200
Environmental & Sustainability Education: Going Global
Environmental & Sustainability Education: Going Global

Figure 2.1
Percentage of students at each proficiency level on the environmental science performance index

Countries are ranked in ascending order of percentage of 15-year-olds below Level D.
Source: OECD PISA 2006 Database, Table A2.1.
StatLink: http://dx.doi.org/10.1787/562200685357
Environmental & Sustainability Education: Going Global

Figure 4.3
Main sources for students to learn about environmental issues in the OECD

OECD average percentages for sources where students mainly learnt about the environmental issues

- School
- TV, Radio, Newspaper or magazines
- Friends
- Family
- Internet or Books

Source: OECD PISA 2006 Database, Table A4.5.
StatLink: http://dx.doi.org/10.1787/562235784260
Back at home: New York City
How do NYC schools engage with Environmental & Sustainability Education?
Chancellor’s Regulation A-850

• Part of PlaNYC 2030
• Established the Office of Sustainability within the Division of School Facilities (2009). Focal areas:
  – Recycling
  – Energy conservation
  – Green curriculum initiatives
• Policy instrument: Requiring every public school to appoint a Sustainable Coordinator
Sustainability Coordinators, Main Position in School
Share of Sustainability Coordinators who volunteered for the role

- Fall 2016: 12%
- Fall 2017: 25%
Would you be willing to continue serving as your school’s Sustainability Coordinator next year?

Spring 2018

- Definitely willing: 48%
- Probably willing: 39%
- Probably not willing: 9%
- Definitely not willing: 4%

Spring 2017

- Definitely willing: 51%
- Probably willing: 35%
- Probably not willing: 10%
- Definitely not willing: 4%
Reasons for willing to continue serving as a sustainability coordinator
Three Types of Sustainability Coordinators

- Integrative Group (n=230) - 18%
- Basic Group (n=473) - 37%
- Transitional Group (n=587) - 46%
Three types of coordinators

- Q15-5: NPO for energy audit
- Q15-2: Power down computers
- Q15-6: Energy challenge
- Q15-1: Recycle campaign
- Q15-3: Awareness campaign
- Q15-4: Maximize daylight
- Q15-6: Energy challenge
- Q14-2: NPO for waste audit
- Q14-4: Both sides of paper
- Q14-6: Staff swap
- Q14-1: Recycle campaign
- Q14-5: Reduce paper by 50%
- Q14-3: Student monitor
- Q14-8: End-of-year cleanout
- Q14-7: Reuse art & craft materials
- Q14-2: Announcement
- Q14-3: Communication
- Q13-1: Outreach campaign
- Q14-9: Minimize course catalogue etc
- Q13-2: Faculty workshop
- Q13-4: Curriculum
- Q13-5: Communication
- Q13-1: Outreach campaign
- Q13-2: Faculty workshop
- Q13-5: Curriculum
Communication & Education

- Infuse sustainability-related content into curriculum: 47% (2018) vs. 45% (2017)
- Communicate sustainability successes, programs and opportunities: 44% (2018) vs. 43% (2017)
- Create or continue to operate a school garden: 36% (2018)
- Hold a sustainability-related outreach campaign*: 25% (2018) vs. 29% (2017)
- Organize an event or program in conjunction with Earth Day: 28% (2018)
- Deliver weekly announcements/reminders: 20% (2018) vs. 21% (2017)
- Conduct a faculty workshop on a sustainability topic/issue: 20% (2018) vs. 18% (2017)
- None*: 15% (2018) vs. 22% (2017)
- Other*: 12% (2018) vs. 16% (2017)
Student green team

- Green team: 27% (Fall 2016), 36% (Fall 2017)
- Plan to establish: 62% (Fall 2016), 47% (Fall 2017)
Recycling and ONE NYC Plan

- Encourage printing or copying on both sides of paper: 70% (Spring 2018), 69% (Spring 2017)
- Have all proper receptacles and signage in place for recycling: 61%
- Reuse materials for arts & crafts projects: 59% (Spring 2018), 60% (Spring 2017)
- Encourage using electronic resources such as Google Classroom: 48%
- Minimize printing and make these materials available online: 44% (Spring 2018), 45% (Spring 2017)
- Create a school-wide campaign to promote waste reduction*: 38% (Spring 2018), 44% (Spring 2017)
- Assign student monitors to ensure recyclables are placed in bins: 43% (Spring 2018), 42% (Spring 2017)
- Organize a school-wide clothing/shoe drive: 20%
- Reduce use of paper school-wide by 50%: 17%
- Organize an end-of-year cleanout aimed at reusing and/or recycling: 14% (Spring 2018), 14% (Spring 2017)
- Host a staff swap to exchange unwanted classroom supplies: 12% (Spring 2018), 13% (Spring 2017)
- Compost organic waste in school garden on-site: 10%
- Enlist non-profit partners to assist with a student-led waste audit: 3% (Spring 2018), 4% (Spring 2017)
- None*: 4% (Spring 2018), 7% (Spring 2017)
- Other*: 7% (Spring 2018), 5% (Spring 2017)
Energy

- Remind staff to turn lights off when rooms are unoccupied: 82% (81%)
- Remind staff to power down computers and smartboards: 70% (71%)
- Remind staff to turn off window air conditioning units: 54%
- Remove personal appliances from classrooms and offices: 43%
- Maximize daylighting where possible: 35% (39%)
- Students and/or staff engage with the Custodian Engineer: 20%
- Hold an awareness campaign on energy conservation: 8% (11%)
- Participate in energy calendar art contest: 8%
- Enlist non-profit partners to assist with energy audits: 2% (6%)
- Participate in GSA Green Cup Challenge: 6% (6%)
- Students and/or Staff went on a Boiler Room tour: 5%
- None: 10% (11%)
- Other*: 6% (4%)

* = new initiatives since Spring 2017
Thinking Global, Educating Local

Dr. Oren Pizmony-Levy
op2183@tc.columbia.edu
Green at Fifteen?

HOW 15-YEAR-OLDS PERFORM IN ENVIRONMENTAL SCIENCE AND GEOSCIENCE IN PISA 2006

Programme for International Student Assessment
ESE as a Fundamental Challenge to Education and Schools

• more than the sheer transmission of knowledge
• does not resonate with the cultural landscape of modern schooling
• does not fit the common disciplinary boundaries, it is multidisciplinary and interdisciplinary
• does not fit the common practice of teaching in class
• emphasizes issues that transcend national borders and associates with world citizenship, thus counter the nation state narrative
Environmental & Sustainability Education

“Environmental education is aimed at producing a citizenry that is knowledgeable concerning the bio-physical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution”

(Stapp et. al 1969)
Environmental & Sustainability Education

“Education for sustainable development aims to help people to develop the attitudes, skills, perspectives and knowledge to make informed decisions and act upon them for the benefit of themselves and others, now and in the future. It helps the citizens of the world to learn their way to a more sustainable future.” (UNESCO, 2005)
ABOUT: Located within the Division of School Facilities (DSF), the DOE Office of Sustainability engages with staff and students to integrate sustainability practices and programs into DOE operations, curricula, and culture.
Impact of NYC DOE

1.1 million students
135,000 employees
1,859 schools
1,400 buildings
130,000,000 sq. ft.
DOE SUSTAINABILITY GOALS

ENERGY & CLIMATE:
• Reduce greenhouse gas emissions from DOE Buildings 80% by 2050 from a 2005 baseline.
• Reduce greenhouse gas emissions from DOE buildings 35% by 2025.

WASTE:
• Send zero waste to landfills by 2030.
• Increased compliance with DSNY waste collection protocol.
Layered Approach:
- Integrate across all layers of DOE

Confluence of Facilities + Education
- Connect Educational Opportunities to Building Assets
- Internal and External Partnerships

Citywide Engagement
- Internal and External Partnerships

Create Robust Programs Around Goals:
Case Study: NYC Solar Schools
Case Study: Zero Waste Schools
DOE SUSTAINABILITY GOALS

**ENERGY & CLIMATE:**
- Reduce greenhouse gas emissions from DOE Buildings 80% by 2050 from a 2005 baseline.
- Reduce greenhouse gas emissions from DOE buildings 35% by 2025.

**WASTE:**
- Send zero waste to landfills by 2030.
- Increased compliance with DSNY waste collection protocol.
A key goal set forth in the OneNYC is to install 100 MW of solar on City-owned buildings by 2025

- Schools are the largest portfolio of city owned buildings
- Schools consume over 25% of NYC’s municipal energy
- Solar is economical, environmental, and most of all, educational!
CASE STUDY: NYC Solar Schools

Leveraging Facility Assets for Sustainability Education

- Professional development training opportunities for educators
- Educator access to real-time solar production dashboards and data
- Display monitors, posters and banners
Layered Approach: Solar Career Tech Education Pilot Program

- Internal DOE Partnerships with STEM, Career Technical Education
- External Partnership with Solar One
- Integrated solar into high school electrical vocational programs, expanding job-training and workforce development opportunities with solar
- 11 CTE high schools
DOE SUSTAINABILITY GOALS

ENERGY & CLIMATE:
• Reduce greenhouse gas emissions from DOE Buildings 80% by 2050 from a 2005 baseline.
• Reduce greenhouse gas emissions from DOE buildings 35% by 2025.

WASTE:
• Send zero waste to landfills by 2030.
• Increased compliance with DSNY waste collection protocol.
CASE STUDY: Zero Waste Schools

Goal: Maximize Landfill Diversion from 100 schools within 5 years; make all schools Zero Waste Schools by 2030.

Facility Resources:
- Uniform Classroom Bins
- Uniform Cafeteria Sorting Stations
- Uniform Hallway/Common Space Bins
- Dual Bin Dollies
- Creation of Waste Storage Areas

Educational Resources:
Customized Programming & Support
CASE STUDY: Zero Waste Schools

Support Facility Infrastructure with Educational Programming

• Support from DOE Sustainability Specialist

• Outside Partners: GrowNYC Recycling Champions Program

• Creation of New Programs:
  – “Race Against Waste”
  – Zero Waste Pledge Schools
CITYWIDE ENGAGEMENT:

• Raise Awareness through Growing Network
  – City Agencies, non-profits, advocacy groups
  – Outreach events

• Maintenance and Growth of Partner Network
  – 46 External Partners, 6 Internal Partners
  – Biannual partner meetings
  – Citywide trainings for all DOE Staff
Sustainability at P721K

Erin Laraway, Sustainability Coordinator
Roy Campanella Occupational Training Center
Brooklyn, NY
Schoolwide Programs Developed

- Edible Garden
- Native Species Garden
- Pollinator Habitat
- Recycling Initiatives
- Indoor School Farmer’s Markets
- Garden to Café Events
- Outdoor Learning Environment
Local Partnerships

- Wild Bird Fund NYC
- Eco Schools
- NYC Department of Sanitation Compost Project
- New York Restoration Project
- Garden to Café
- Grow to Learn
- Green Thumb
- Project Butterfly NYC
- Student Volunteer Park Maintenance Program at Floyd Bennett Field
Awards, Recognitions & Grants

- Citation from Brooklyn Borough President, Eric Adams
- New York Restoration Project Rose Award (citywide winner)
- Golden Apple Award
- $12,000 in Grants and donations for school garden initiative
Lessons Learned

• Students benefit from outdoor, hands on learning experiences.
• Spending time in nature reduces stress for staff and students.
• Students are motivated and happy to learn outdoors.
• Increased student engagement.
Sustainability 2019

P77K @ 62 Park Place

Jazzmen Murphy, Teacher/Sustainability Coordinator
Ellyn Kerr, Teacher
Sarah McDowell, Teacher
Marisa Beharry-Vanzie, Assistant Principal
The History of P77K’s Sustainability Efforts
In the past, the P77K School Garden was a beautiful floral garden. It was a floral garden because it was assumed by the Botany Teachers that it might have a high concentration of lead due to the age of the building.

- Teachers and students worked in the garden and attended daily classes at Brooklyn Botanical Garden to further their Botany skills. Eventually, fruits and vegetables were planted in large containers located on the side of school building. The containers were placed on the concrete walkway and never were placed in the soil garden.
Fast Forward to 2018 and RAGS!

- Mrs. Kim Velez who was an integral part of Project RAGS insisted that a soil test be completed for possible contamination. I agreed as some staff members felt that we should plant vegetables in the soil garden.

- The test showed that the lead content was 408 ppm which is above the acceptable limit for planting any type of edible plants.
Project RAGS

- P77@902 co-located with another school in Sheepshead Bay for two years while the building was being renovated. We assumed that parts of the school grounds would not be in great shape upon our return and we were correct. The school garden was overgrown with English Ivy. Garbage and construction debris was scattered throughout it, too.

- We were devastated and were wondering how would we get our Floral School Garden back to it’s splendor.

- Ellyn Kerr, the former Sustainability Coordinator wrote a $5000 NYCDOE Office of Sustainability grant which she was awarded. Thus we began to clean up and beautify the school garden.
The Clean Up!

• Students worked together to make RAGS a success. I was amazed at how well they all enjoyed working in the garden.
Some construction items found in the garden
Students and staff working together!
Recycling at 77K

- Students were given a tally sheet which was broken down into 3 categories using the following percentage which were color coded: 25%, 50%, 75% and 100%.
- Each class had a final tally and even ticket was issued for improper recycling.
Students from Mrs. Velez’s class decided while recycling that they wanted to give classes that were not recycling correctly a ticket. A ticket was issued for any category that scored 50% or under. The tickets were made out of index cards in the beginning. However, later on, a formal one was designed by Ms. Ellyn Kerr, the former Sustainability Coordinator. Criteria for the ticket was determined by the students.
Kudos's to all who participated in the 2017-2018 Sustainability Initiative

- Mrs. Kim Velez
- Ms. Aleida Ward
- Ms. Dawn Kerhonsen
- Ms. China Brown
- Ms. Chanel Lindsay
- Mr. Jason Corley
- Danielle Boree
- All of the P77K students and staff who participated in the garden and recycling projects.

- P.77K Administrators
- Mrs. Ebony Russell, Principal
- Assistant Principals
- Ms. Carmela Montanile
- Mrs. Marisa Beharry-Vanzie
- Mrs. Allison Nadage
What is Happening at P77K Now?
Team DOPE

• Classes X03 and X04 have joined forces to create a mini Sustainability Team named Team DOPE (Defending Our Planet and Environment).

• Team DOPE was created to continue bringing environmental awareness to our school, monitor recycling efforts, and stress the importance of reducing the use of plastic.
Say No to Plastic Pledge

• The students of class X03 and X04 have taken a pledge to say “No” to plastic water bottles and “Yes” to refillable water bottles.

• We have taken this pledge to assist in reducing the amount of plastic we use in our everyday lives in order to help save our ecosystem and marine life.
As a part of our initiative to reduce plastic water bottle use, Team DOPE (Defending Our Planet and Environment) has revamped our garbage checking system.

Team DOPE evaluates each of the three garbage bins (Trash, Mixed Paper/Cardboard, and Metal/Plastic) located in every classroom, biweekly, to determine if the garbage disposed in those classrooms has been sorted appropriately.

To record their findings, the team uses a data sheet that tracks how well the citizens of each class have sorted their trash with a special focus on plastic water bottle use/disposal.

Lastly, the team members evaluating the bins ask the classes to promise that they will start/continue to recycle correctly.
Data Collection

• All of the data that has been collected will be closely evaluated by Team DOPE.

• The members of the team will compare and contrast the data collected to determine the progress each participating class has made from January to April.

• We aim to present our data to the school during our Earth Day celebration.
We are excited to announce that we have been awarded the Refillable Water Station Grant funded by the Office of Sustainability!

Team DOPE, Ms. Jazz, and Ms. Sarah committed to developing a plan to reduce plastic water bottle use and were able to convey all of our ideas in our grant proposal.

We are thrilled that the students will be able to utilize their water bottles and refill them without difficulty in a communal area that is accessible to the entire school.

Team DOPE is also eager to unveil the station to the entire school with their “Say No to Plastic” Campaign this spring!
Special Thanks

- We would like to give a special thanks to all who have helped P77K bring about sustainability awareness. We appreciate you all and we will continue to advocate for a more well-balanced environment.
Questions?
THANK YOU

Please visit www.tc.columbia.edu/sustainability