

# Forging Partnerships to Build Local Capacity for CTE

*Dr. Howard Lerner, Superintendent, Bergen  
County Technical Schools, Paramus, NJ*

*Mr. James Fasano, Principal, Bergenfield High  
School, Bergenfield, NJ*

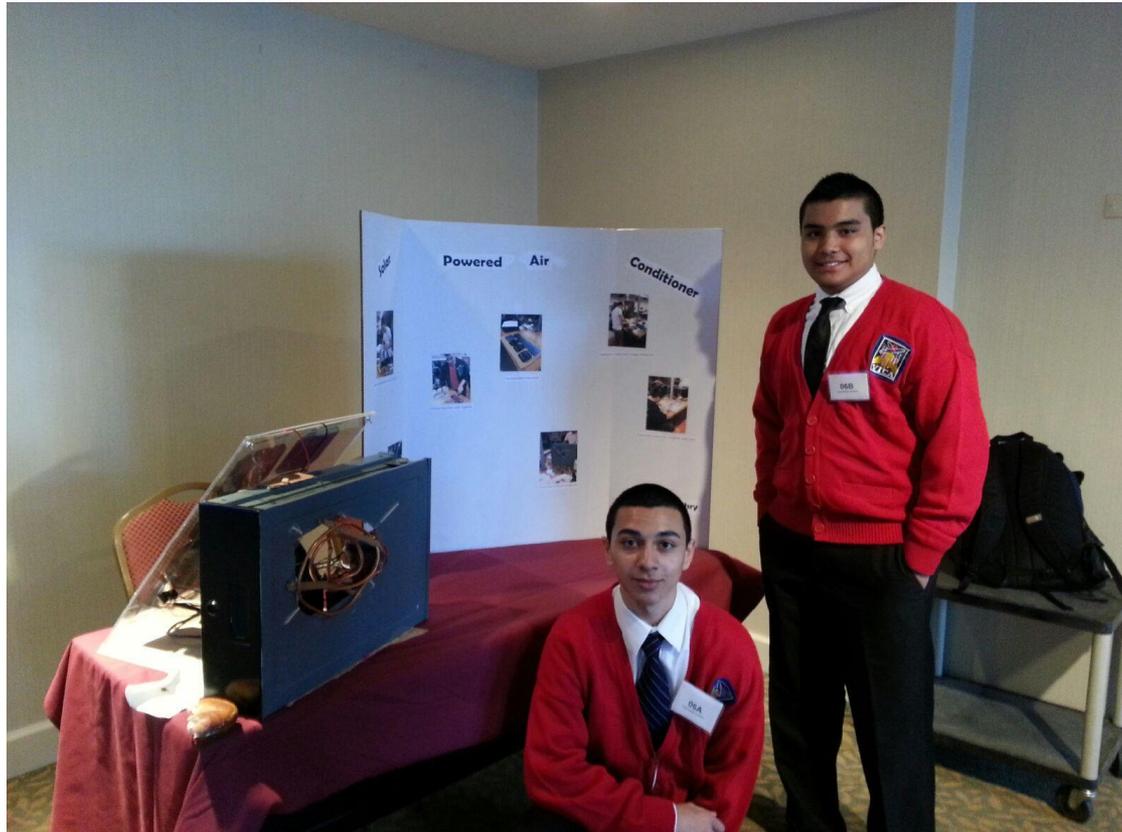


# Our Agenda

- What CTE brings to the table for our students
- Creating a plan to increase local capacity
- Building a CTE program
- Mapping out a plan for your community



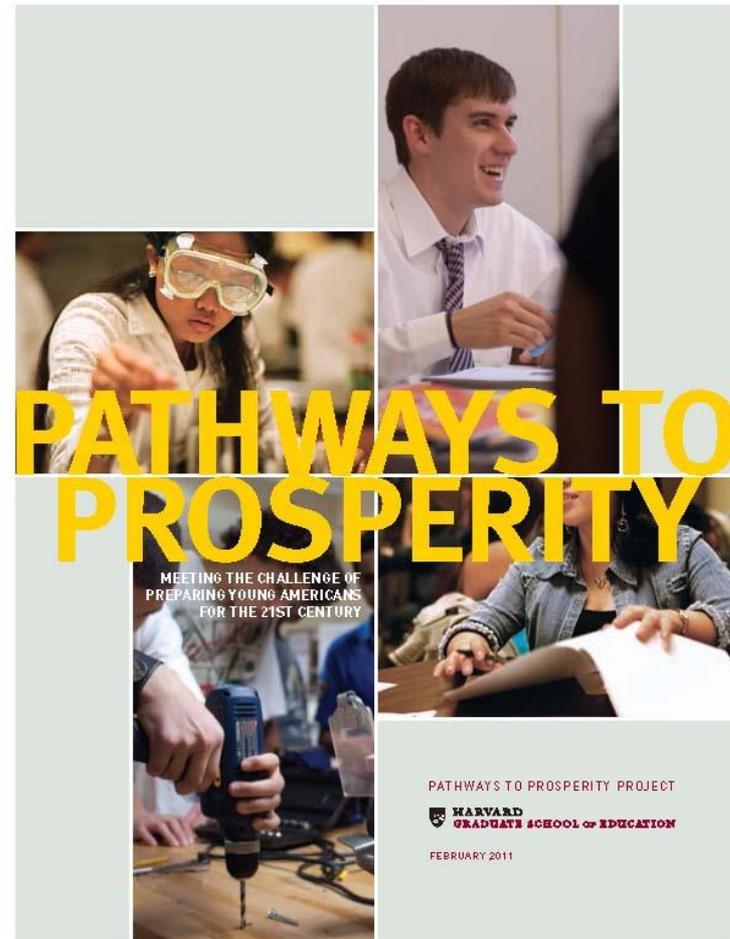
# Shahbaz's story



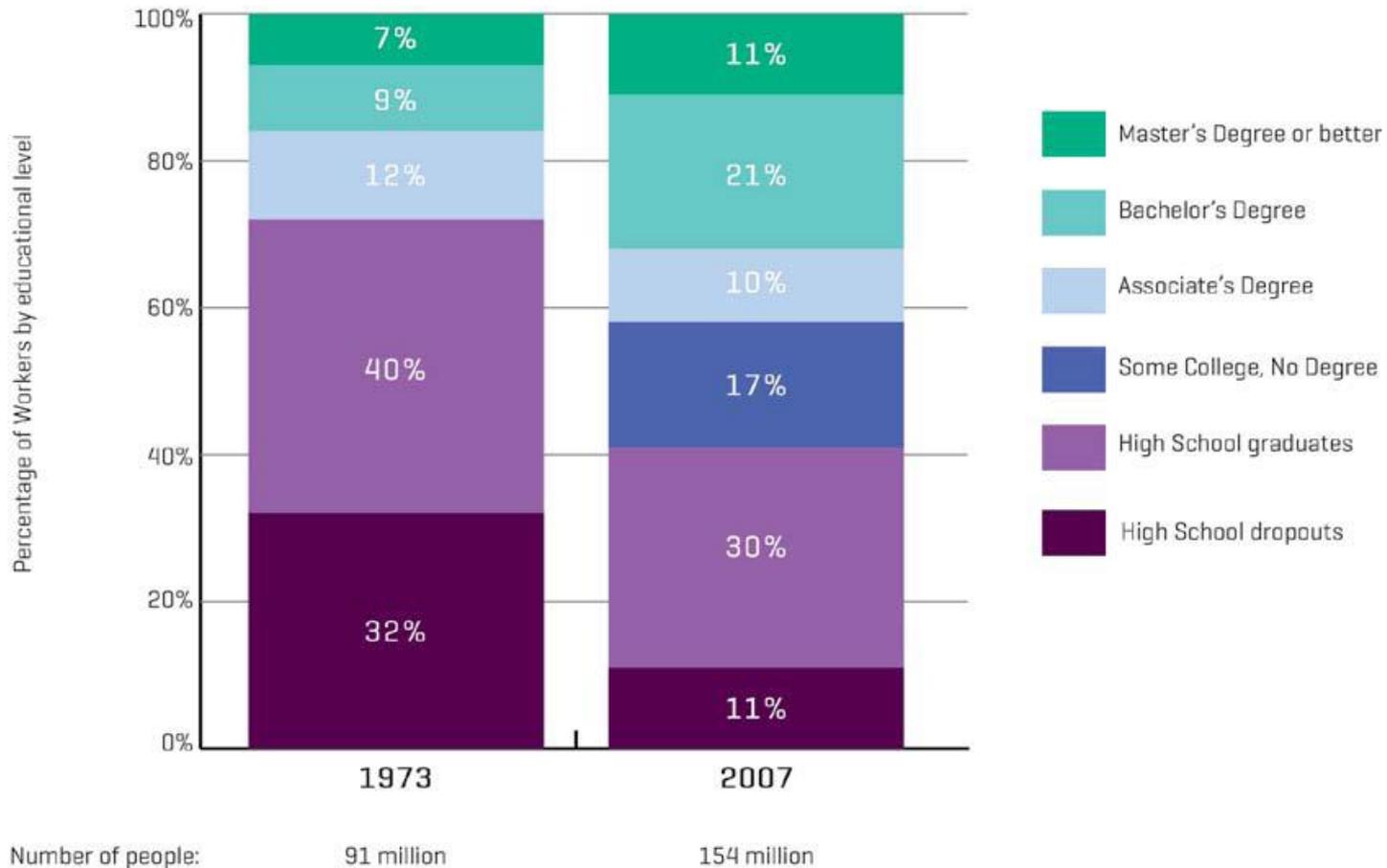
Two of our Green Tech students competing at this year's local Skills USA Competition

# The need for CTE

- Meeting the demands of a changing job market
- Bringing relevance for disconnected students



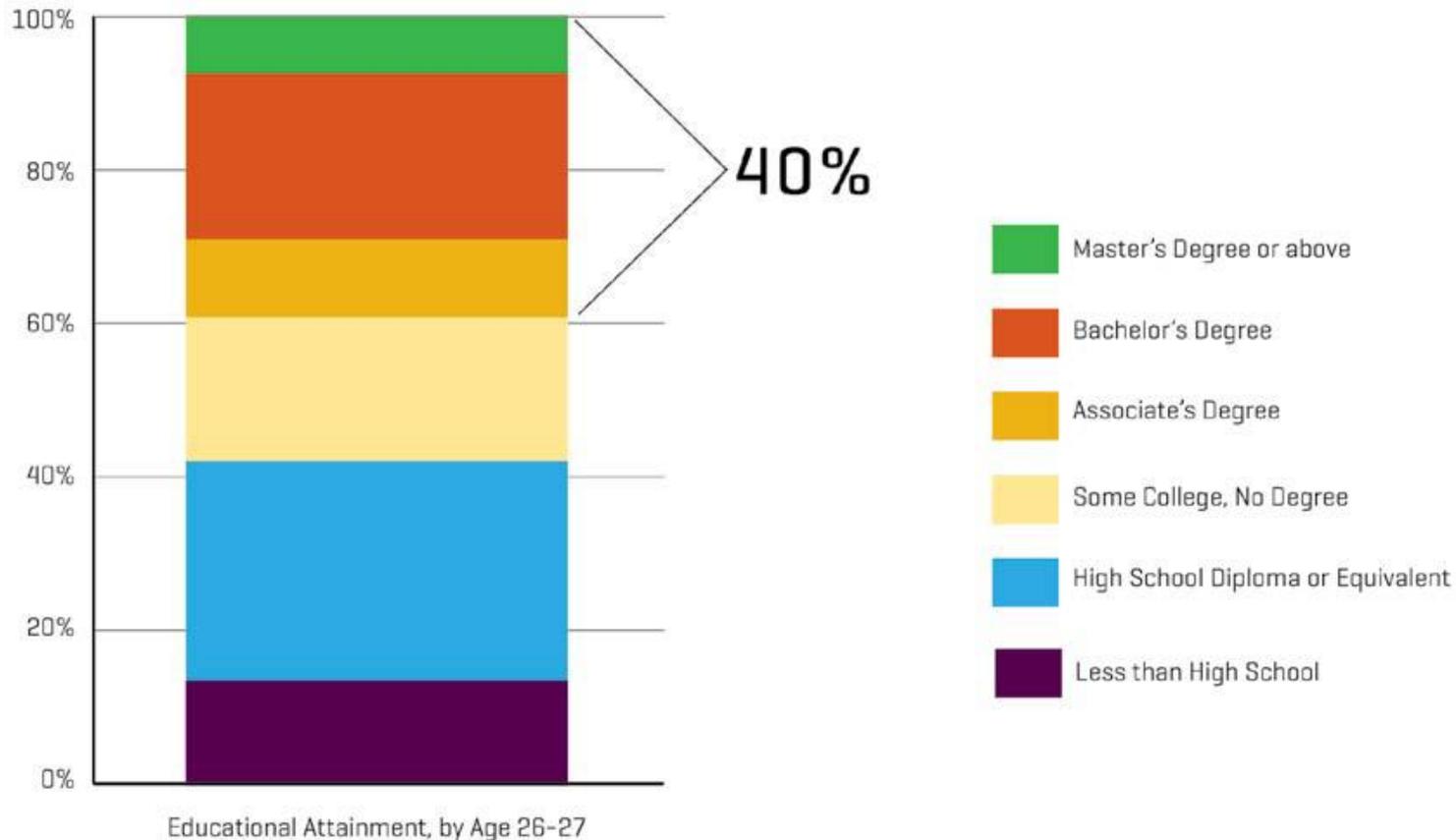
# National Workforce Needs



Over the next ten years, those with no more than a high school degree will only be qualified for 36 percent of the job opportunities. Many of these opportunities will be for people with AA degrees or occupational certifications

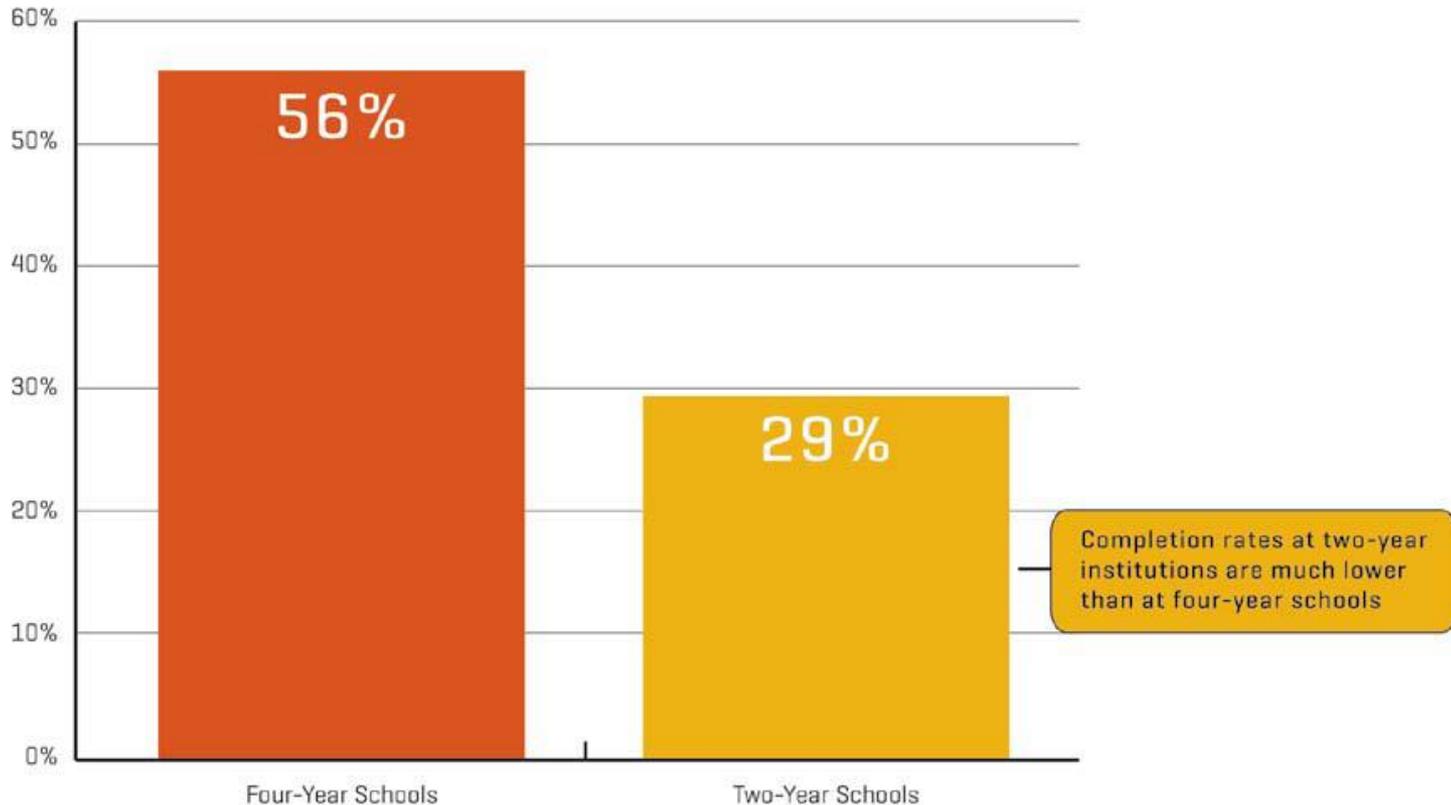
Source: Harvard Study, 2011

# National Workforce Reality



The current US reality: only 40% of 27-year olds have earned an A.A. degree or higher

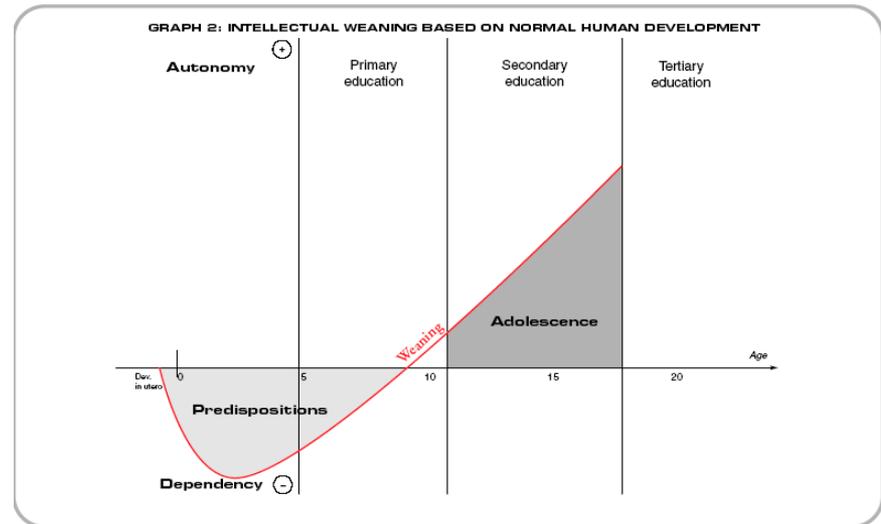
# College Completion Rates



Causes are a combination of an inability to place out of remedial courses and students failure to see a clear connection between their school work and job opportunities

# Motivating disconnected students

- Our approach to teaching teens may be part of the issue
- Need a more hands-on learning environment
- More opportunities to explore individually

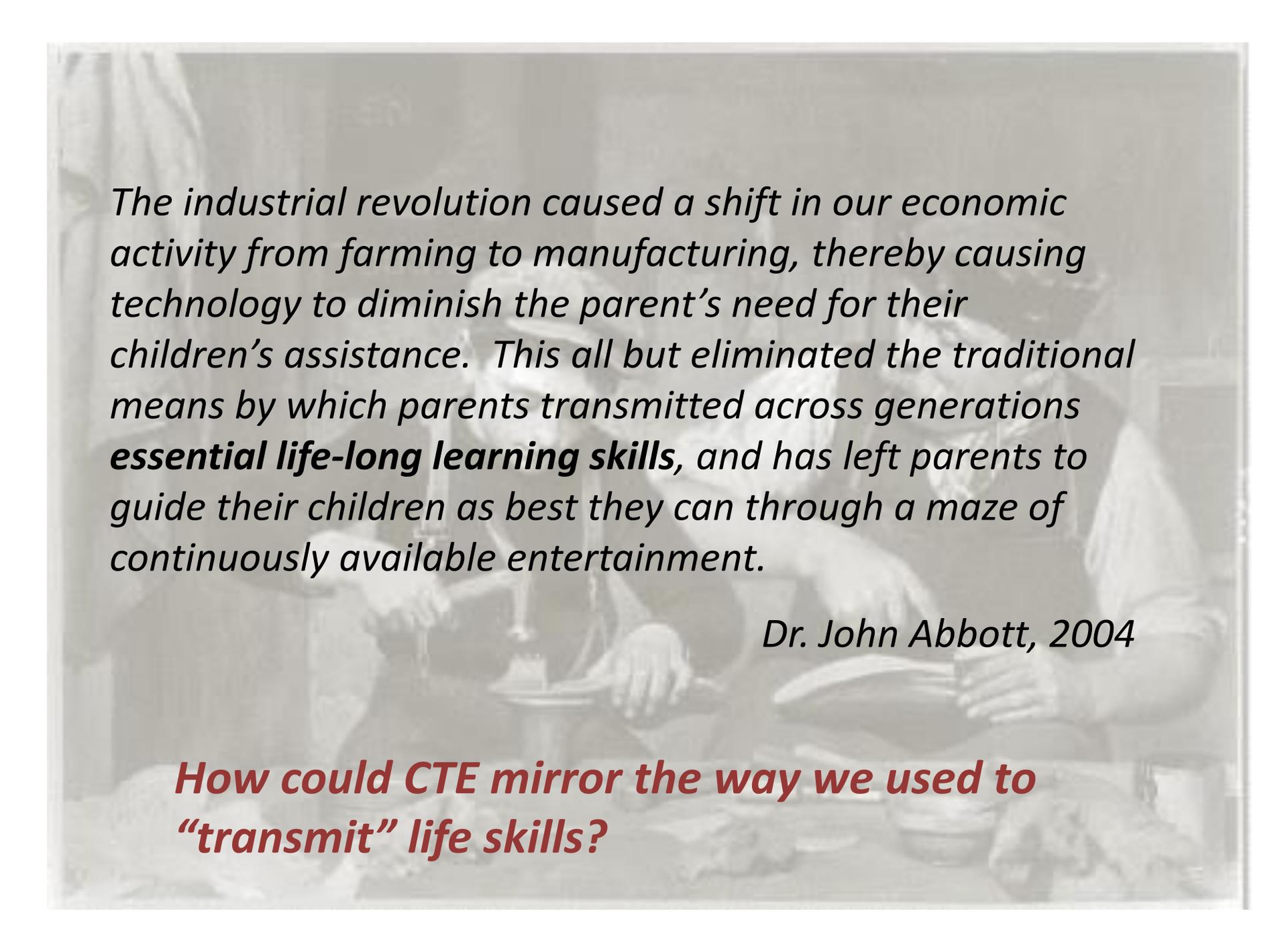


*What does this say about the way adolescents learn?*

# Harnessing the full potential of the adolescent mind

- We learn best when we have to
- Encourage students to take risks now
- Allow students to work through problems that require the marriage of emotional and intellectual thinking
- Harness their energy in application and apprenticeship

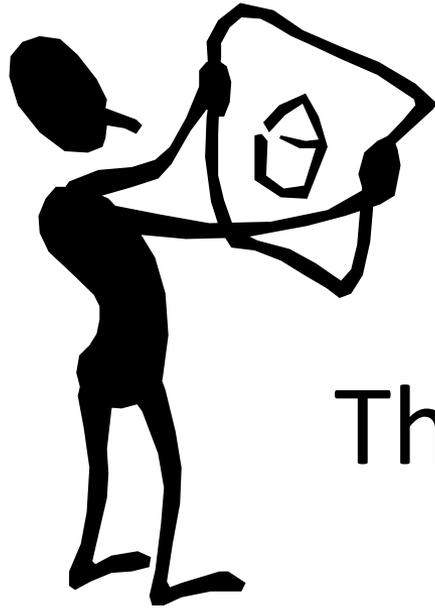
*How could CTE help with this?*



*The industrial revolution caused a shift in our economic activity from farming to manufacturing, thereby causing technology to diminish the parent's need for their children's assistance. This all but eliminated the traditional means by which parents transmitted across generations **essential life-long learning skills**, and has left parents to guide their children as best they can through a maze of continuously available entertainment.*

*Dr. John Abbott, 2004*

***How could CTE mirror the way we used to "transmit" life skills?***



# The Plan

Building a CTE program from the  
ground up



# The Partnership



- Bergenfield Public Schools
- Bergen County Technical Schools & Special Services
- Long history of working together
- Share a common vision of access to rigorous education
- Both identified a student profile that was in need

# Identifying the right CTE program

**Green jobs** are those that provide products/services that promote renewable resources, reduce pollution, and support the local economy

- Energy engineer
- \*LEED Architect
- Environmental engineer
- Energy auditor/retrofitter
- Construction manager



\*Leadership in Energy and Environmental Design

# An emerging job market

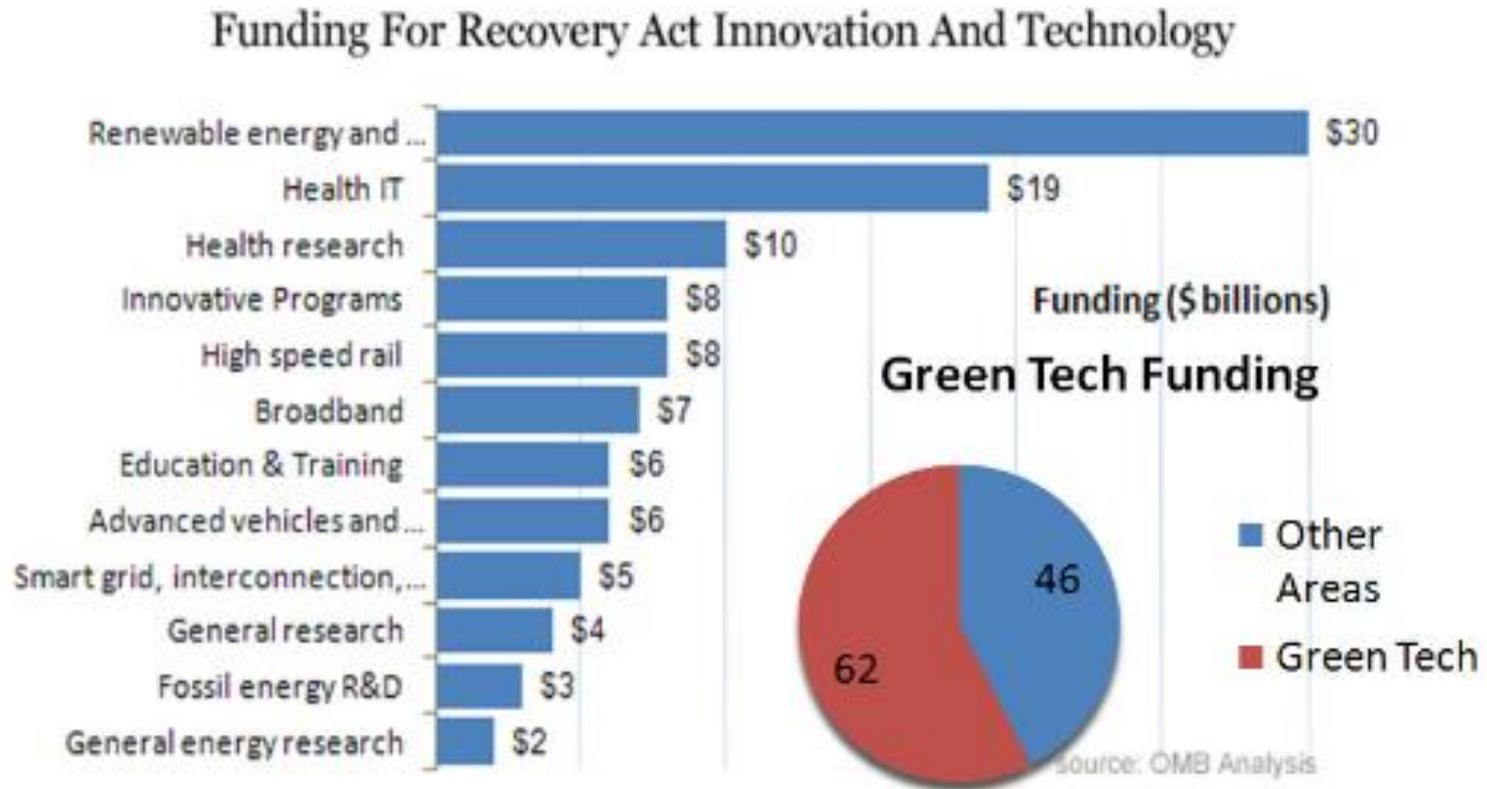
## Ten Years in Clean Tech: At a Glance

|   | 2000             | 2010                  |
|---|------------------|-----------------------|
| Combined Global Market for Solar PV and Wind                    | \$6.5 billion    | \$131.6 billion       |
| Average Cost to Install a Solar PV System (Per Peak Watt)       | \$9              | \$4.82                |
| Number of Hybrid Electric Vehicles on the Road in U.S.          | Less than 10,000 | More than 1.4 million |
| Number of Hybrid Electric Vehicle Models Available Globally     | 2                | 30                    |
| LEED-Certified Commercial Green Buildings in the World          | 3                | 8,138                 |
| Number of U.S. States with RPS                                  | 4                | 29                    |
| Percentage of Total U.S. Venture Capital Invested in Clean Tech | Less than 1%     | More than 23%         |

Source: Clean Edge, Inc., 2011

Trends project an increasing need for green tech skills

# Government investment



Increased federal funding will lead to opportunity for those with green tech skills

# Recruiting students

- Worked closely with middle school guidance and teachers to identify candidates
- Used 7<sup>th</sup> and 8<sup>th</sup> Grade NJ ASK scores and grades to target the right students
- Conducted open house presentation to students and parents
- Walked them through sample lab activities

# Used short essays to narrow down

## Sample:

*In 50 words or less, explain why you think **sustainability** is the greatest challenge of your generation as well as the role that you see yourself playing in addressing that challenge.*



# Enrollment

- Year 1 Cohort (Class of 2015): 18
- Year 2 Cohort (Class of 2016): 11
- Year 3 Cohort (Class of 2017): 19



Green Tech students conduct experiments in preparation to compete for the best wind turbine design

# Recruiting a teacher

Looking for two possibilities:

1. A CTE person with the ability to do hands-on technical work (i.e. electrical) and the passion to research the scientific/social connections OR
2. A science person with the passion to learn the hands-on elements

Reached out to local universities and CTE organizations for help

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Reached out to local universities and CTE organizations for help

PD resources like *C-Tech* were instrumental in providing the necessary training

# Designing the curriculum



# Program Goals

- To provide students with the passion and tools to design a more sustainable future
- To prepare students for a high-demand, technical career pathway



# Started with essential questions

- What is the basic process that engineers use to design products and why is an understanding of sustainability important to that process?
- How do humans interact with, disrupt, and enhance the natural systems of Earth?
- How can the renewable, clean energy of the wind and sun be harnessed for heating and electricity?
- How are the steps in the design process applied throughout an independent project to ensure a successful end product?

# Broke out the content

## Sampling of units:

- Pictorial Sketching/Hand Drafting Techniques
- Parametric Modeling-Basics of CAD
- Materials life cycle, Embodied Energy, and Minimization of Waste in Design
- Group Dynamics and Project Management
- The Impact of Wind Energy Technology on Society and the Environment

# Committed to performance assessment

## Sample performance tasks:

- Utilize the design process to make a solar cooker
- Design and build an off-grid, photovoltaic system
- Construct a rainwater harvesting system
- Create a PSA to inform your community about the factors that may contribute to changing levels of key substances in our environment

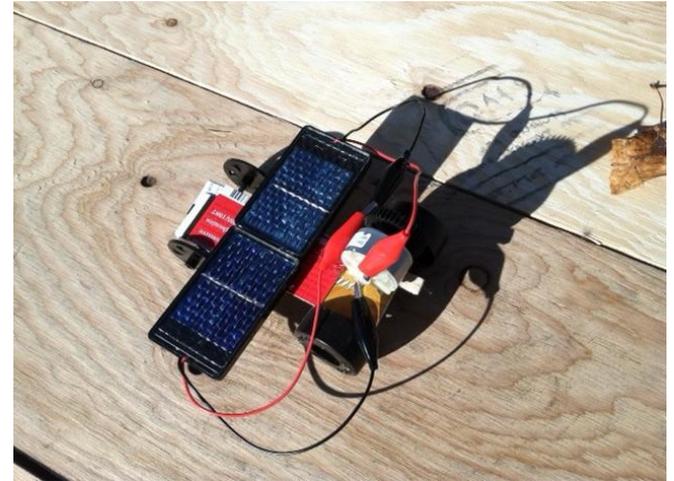


# Projects, projects, projects



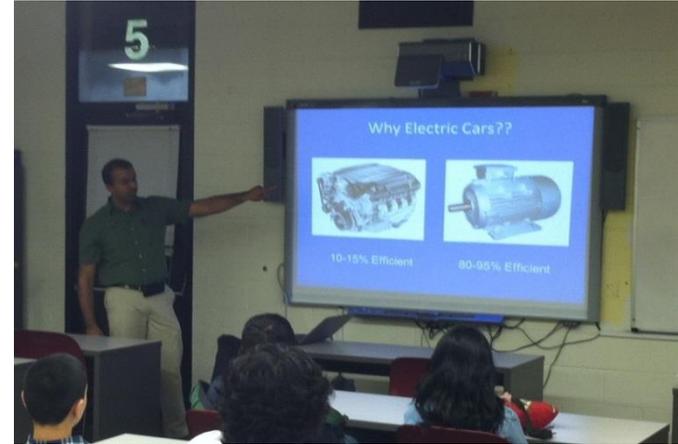
The Sustania Project asked students to work in teams to create a sustainable city complete with energy generation, food systems, and water delivery and purification

The Solar Car Competition asked students to design, wire, build, test, and refine a solar-powered miniature race car  
[VIDEO](#)



# Resources and Support

- NJDOE Green Technology Pilot Program
- Outside consultants
- Vendors (i.e. Lab-Volt, C-Tech)
- Local universities
- International partnerships



*FDU presentation on electric vehicles*



*Student trip to the Eco-complex at Rutgers*



# Global Outreach



Green Tech students videoconferencing with students from the Mfantshipim School to discuss global issues related to sustainability. This was the first secondary school to be established in the Gold Coast (now Ghana) in 1876.

# Post Secondary Articulations

## Possibilities:

- Fairleigh Dickinson University (adv. standing)
  - BS in Construction Engineering Technology
- Bergen Community College (dual enrollment)
  - Environmental Chemistry (4 credits)
  - Sustainable Design and Construction (3 credits)



# Road Map Activity

- Find a partner nearby
- Decide which one of you will be the “subject” of this community needs assessment activity
- It should be the one that has the best feel for the needs of underachievers in their community
- Find your activity sheet



# Interview the Subject

- Describe a student group in your community who would benefit from a CTE program
- What CTE programs would address their needs?:



- Identify local partners (i.e. industry, post-secondary) who might help

# Additional Resources

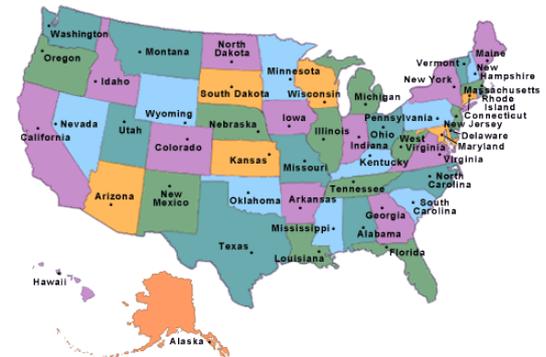
National Job Projections

<http://data.bls.gov/oep/nioem?Action=empios&Type=Occupation>



Regional Job Projections

<http://www.bls.gov/data/#regions>



# Questions?

