

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*

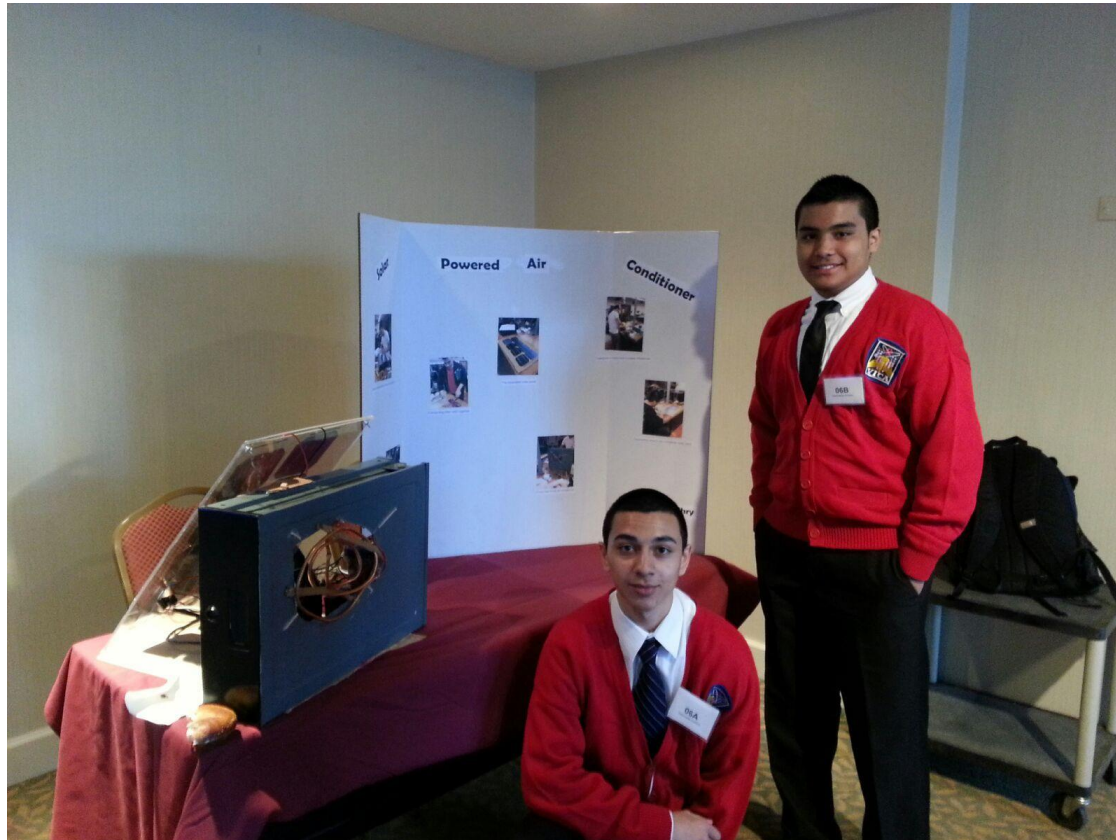


Our Agenda

- 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



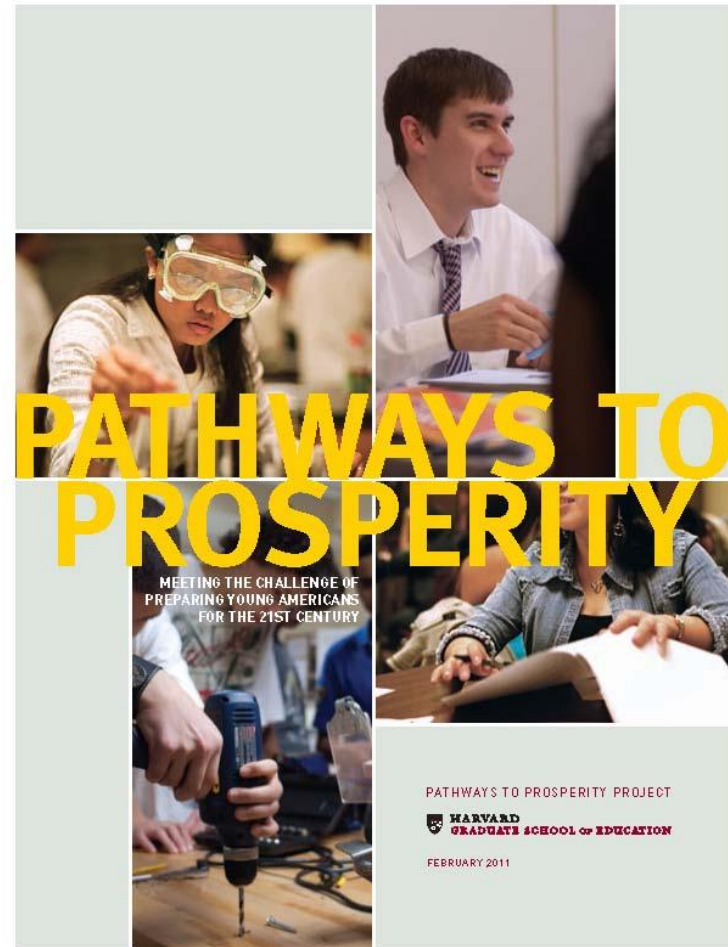
Shahbaz's story



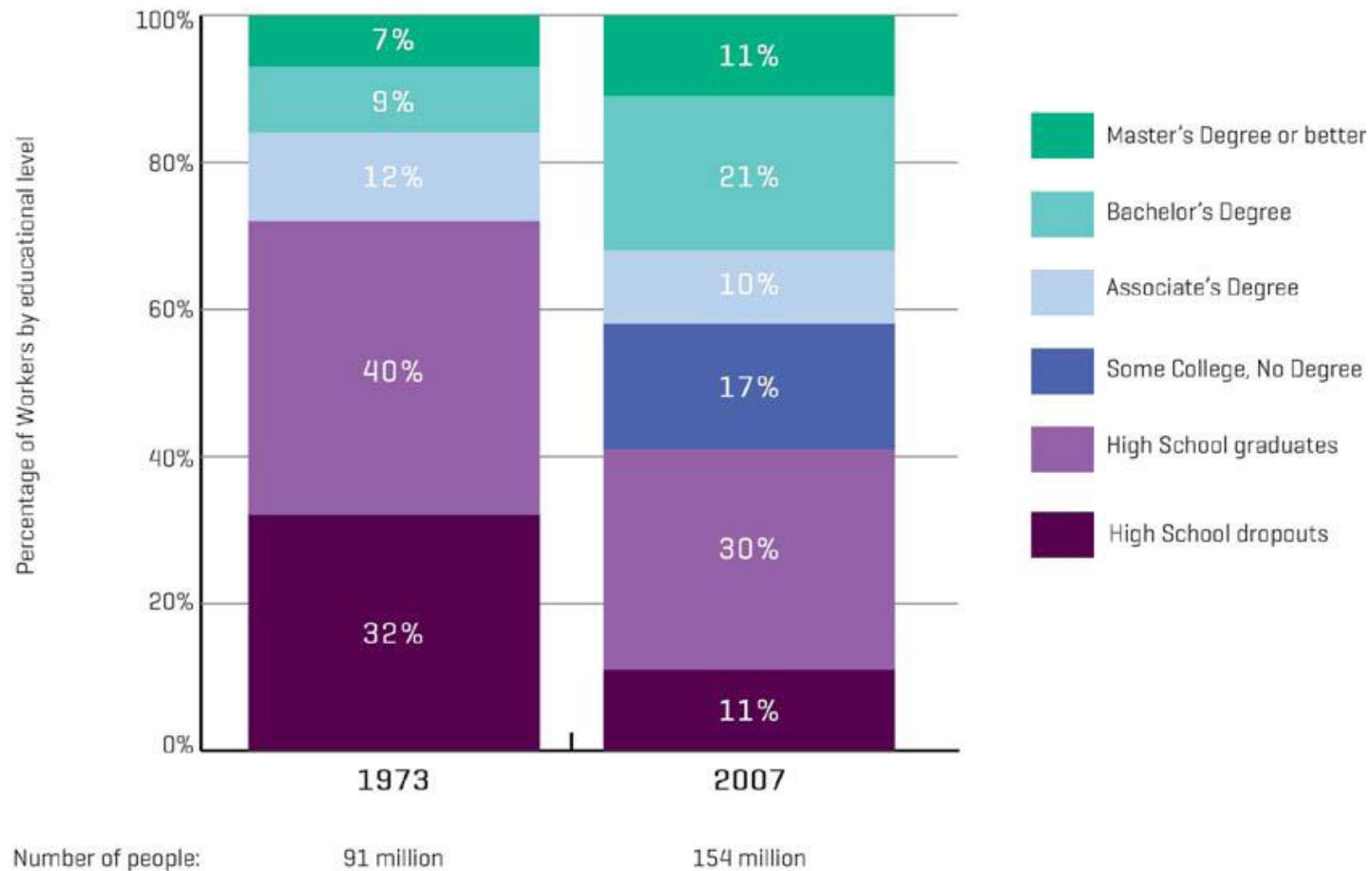
Two of our Green Tech students competing at this year's local Skills USA Competition

The need for CTE

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



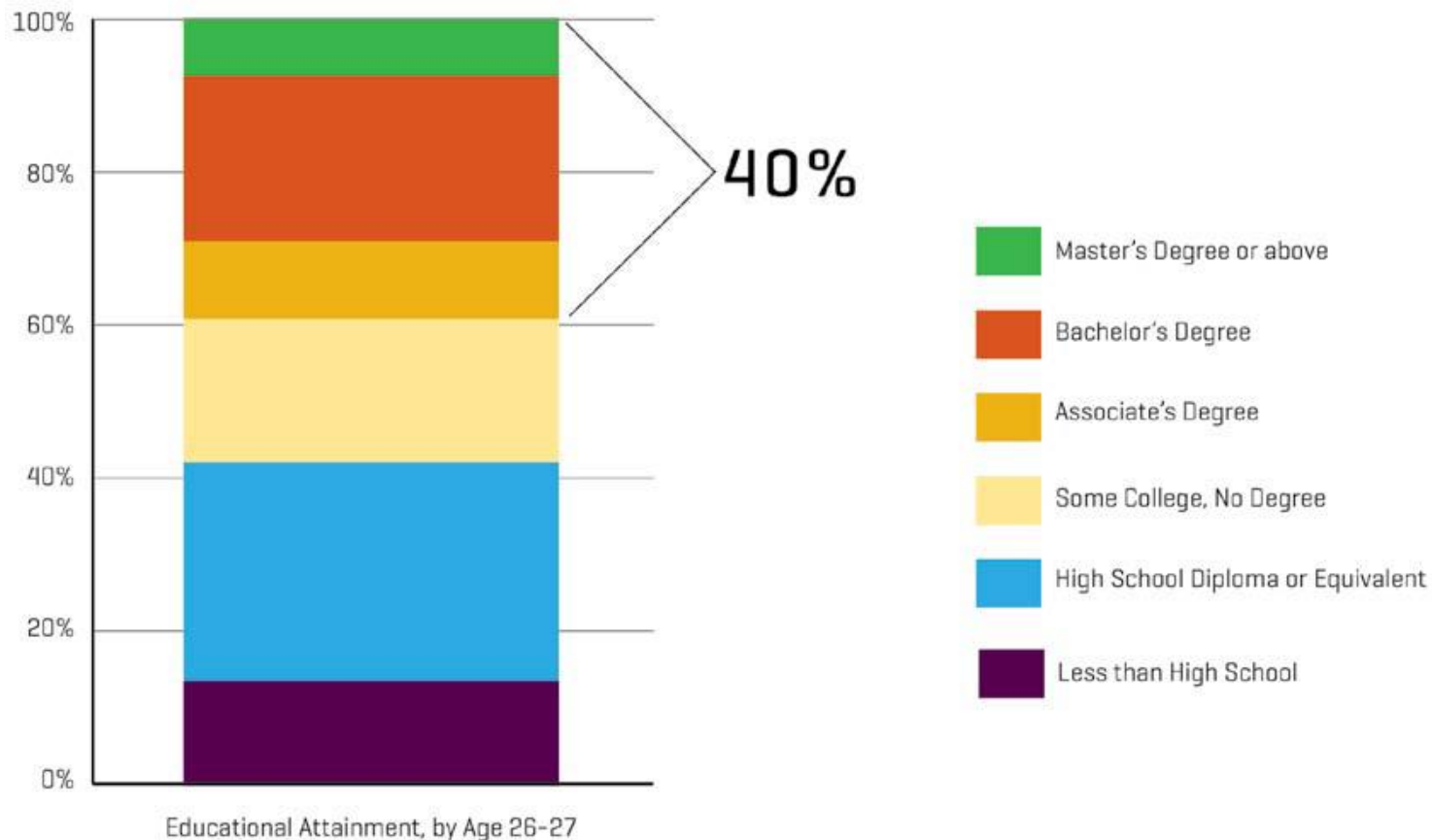
National Workforce Needs



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

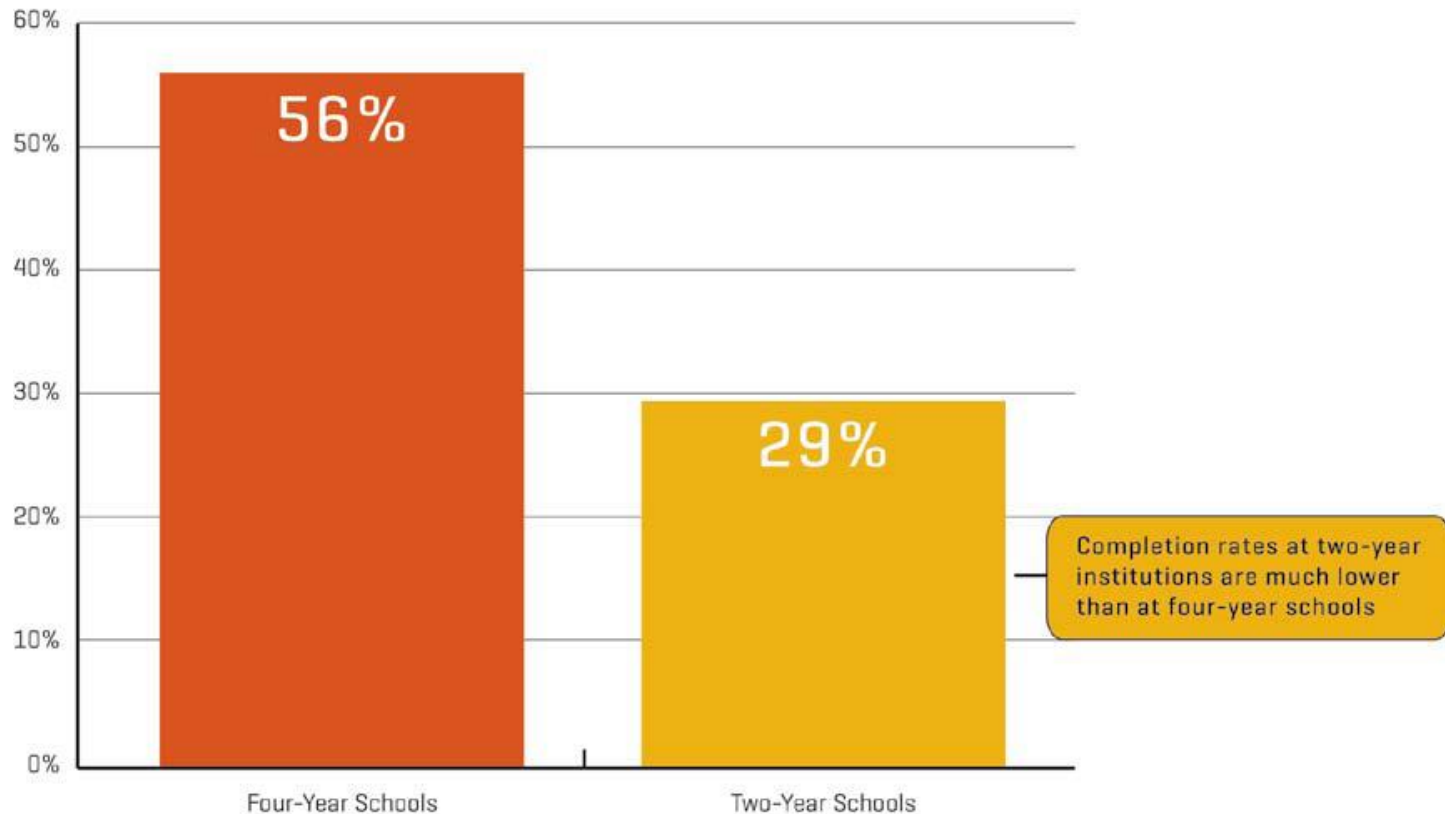
Source: Harvard Study, 2011

National Workforce Reality



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

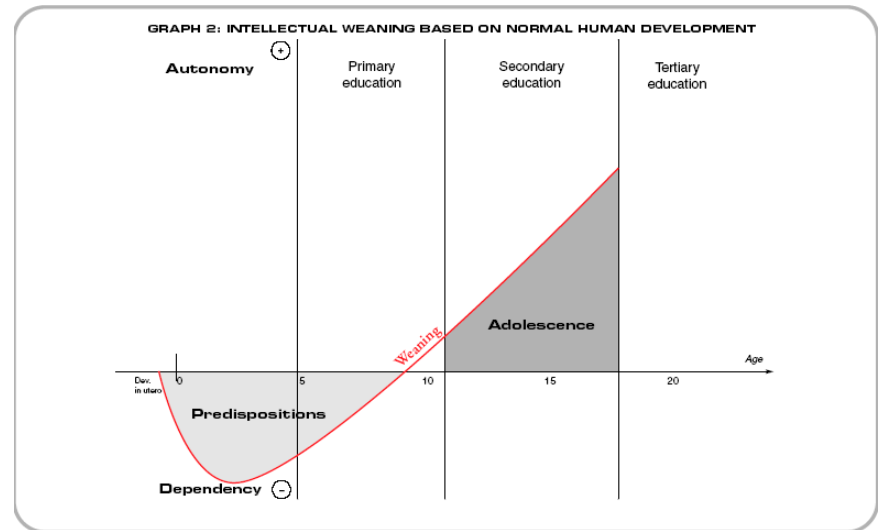
College Completion Rates



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

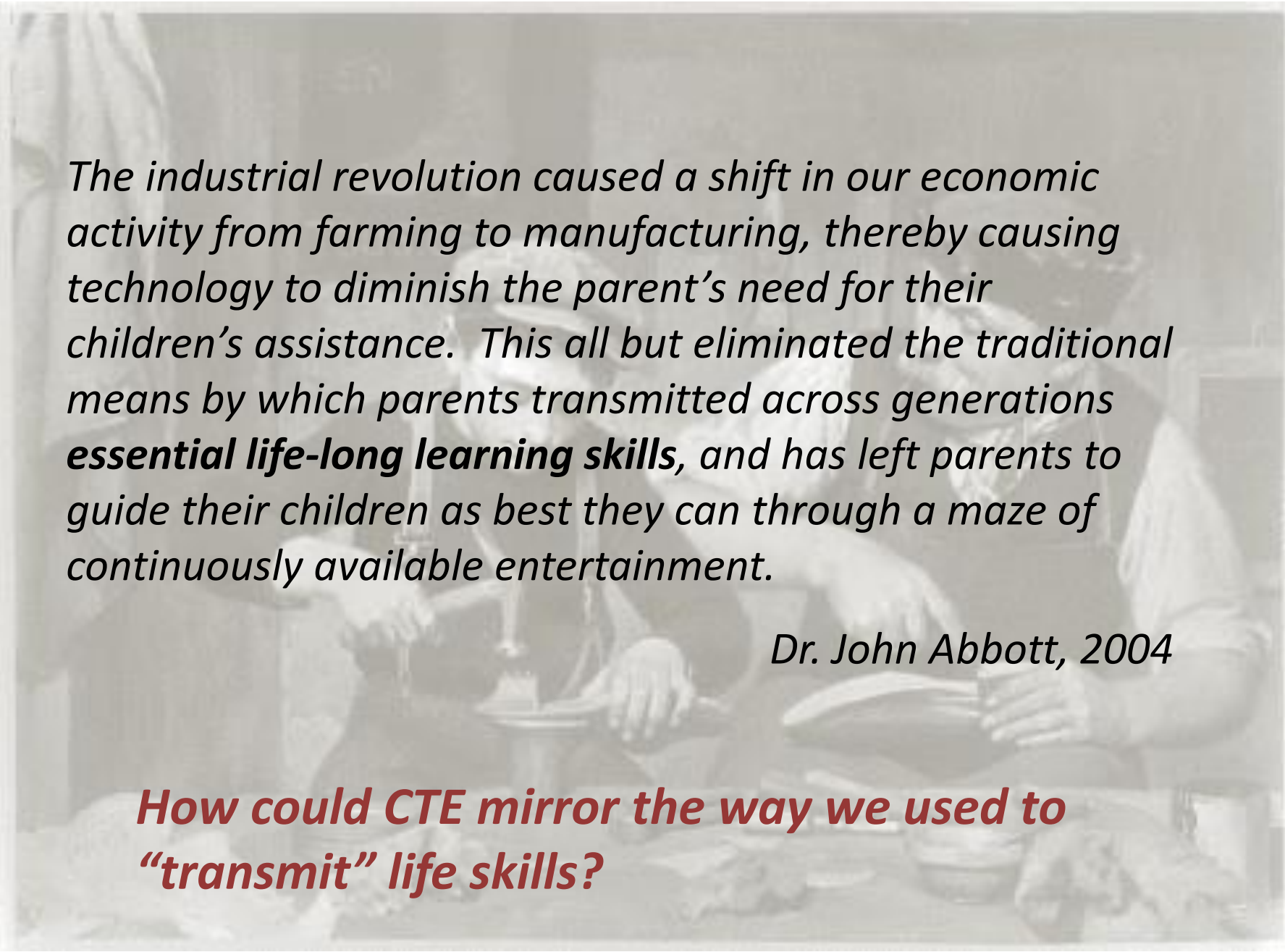


What does this say about the way adolescents learn?

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

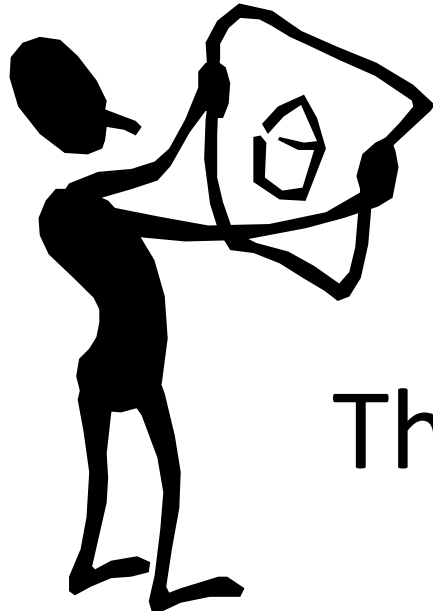
How could CTE help with this?



*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

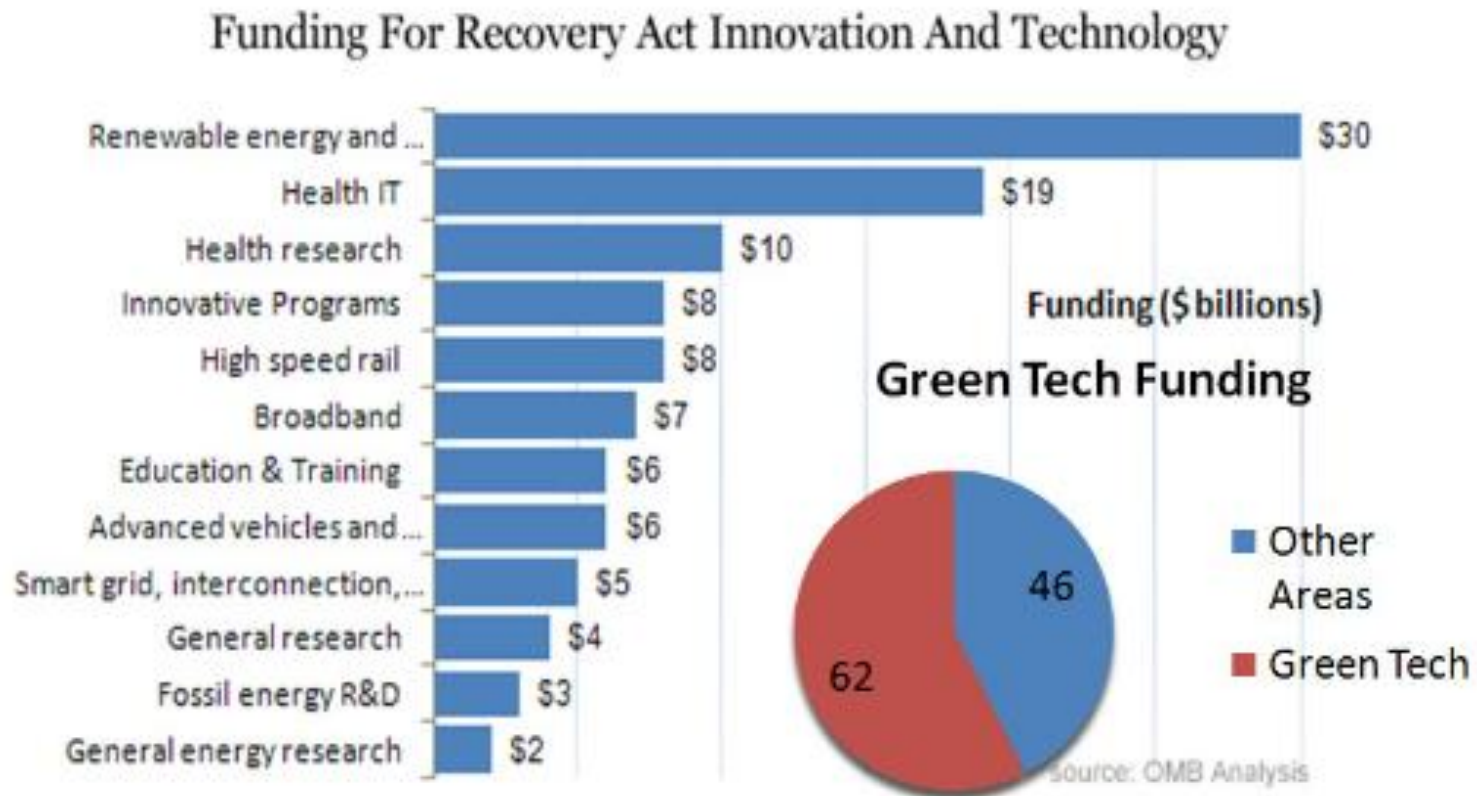
Ten Years in Clean Tech: At a Glance

| | 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 7th and 8th 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

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

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

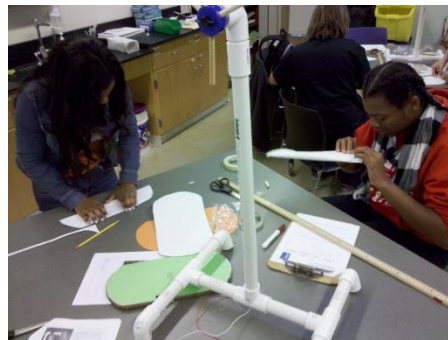
Sampling of units:

- 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

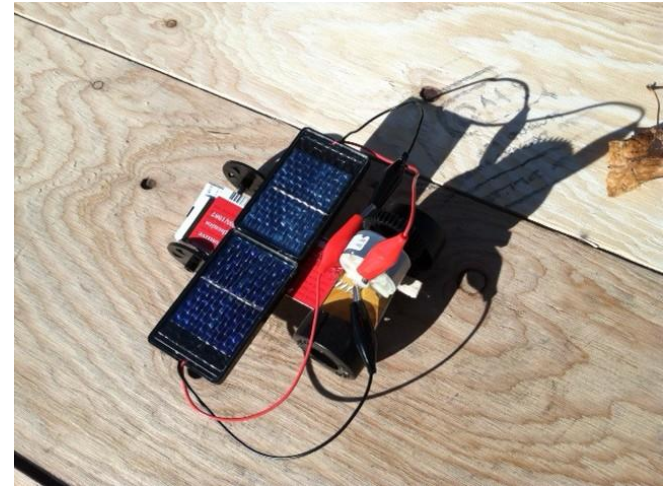


Projects, projects, projects



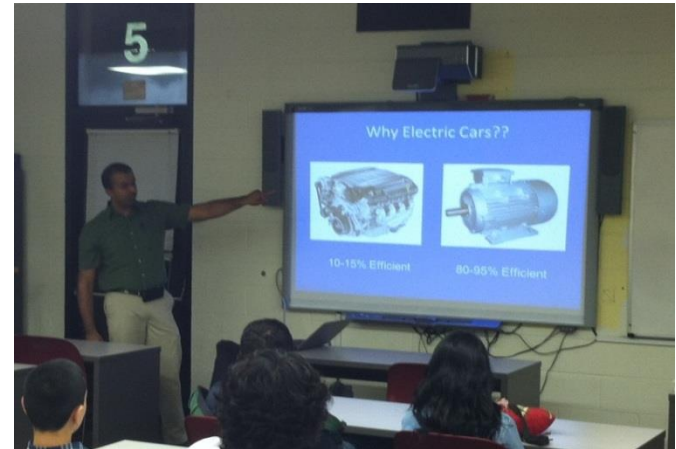
The Sustania Project asked students to work in teams to create a sustainable city complete with energy generation, food systems, and water delivery and purification

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



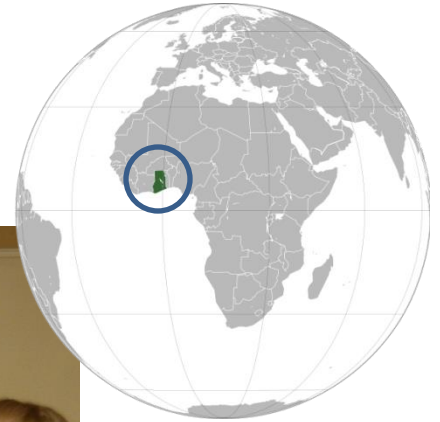
FDU presentation on electric vehicles



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

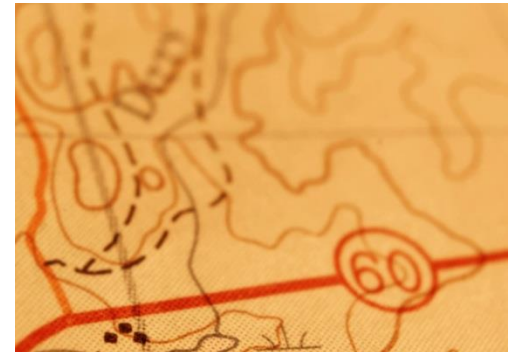
Possibilities:

- 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?

