

SREB

HSTW

Joining a College-Ready Academic Core with Intellectually Demanding Career/Technical Education

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Southern
Regional
Education
Board

**The world of
work has
been
changing!**



**Do you know what employers
are looking for in entry level
workers?**



**Are your students
really ready to work?**



New Entrants from High School



- Professionalism/Work Ethic
- Teamwork/Collaboration
- Oral Communications
- Ethics/Social Responsibility
- Reading Comprehension

The Conference Board, et. al, *Are They Really Ready for Work*. 2006: Ranking for top five combined applied and basic skills, page 21.

New Entrants Two-Year Colleges

- Professionalism/Work Ethic
- Teamwork/Collaboration
- Oral Communications
- Critical Thinking/
- Problem Solving
- Reading Comprehension



The Conference Board, et. al, *Are They Really Ready for Work*. 2006: Ranking for top five combined applied and basic skills, page 21.

New Entrants Four-Year Colleges

- Oral Communications
- Teamwork/Collaboration
- Professionalism/Work Ethic
- Written Communications
- Critical Thinking/Problem Solving



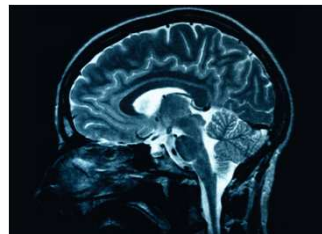
The Conference Board, et. al, *Are They Really Ready for Work*. 2006: Ranking for top five combined applied and basic skills, page 21.

New Vision for CT Education



Hands-On

Minds-On

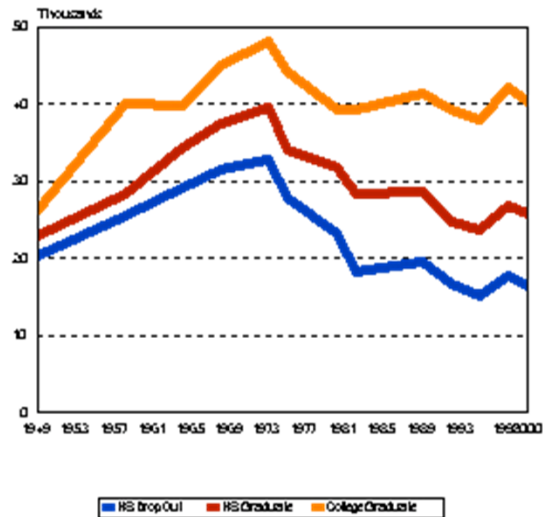


Have you met the **goal?**

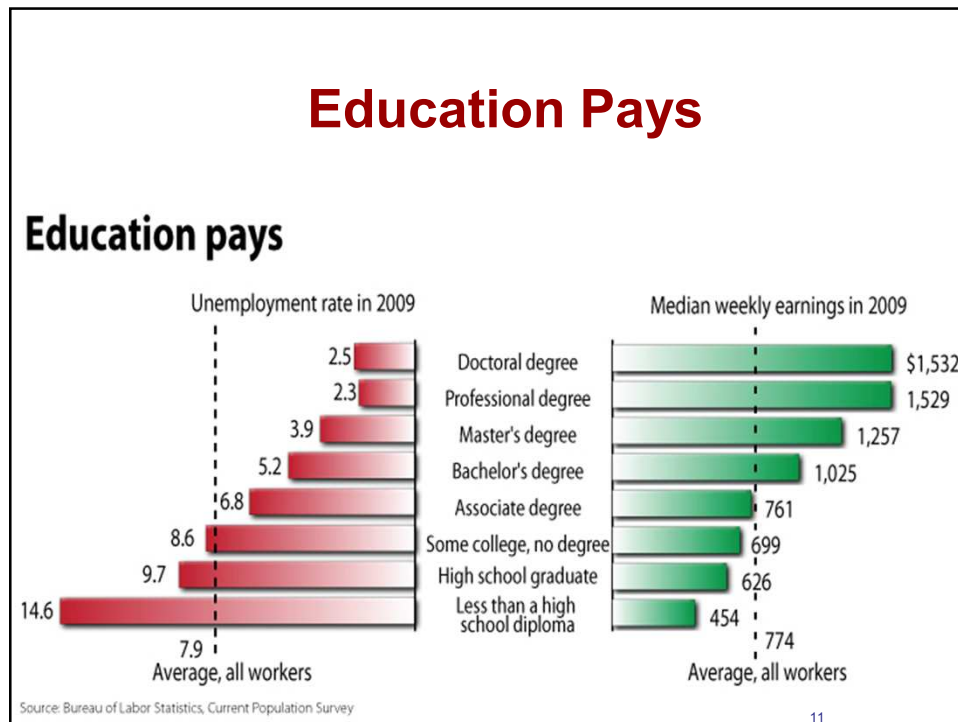


90%

Median Income of Male Americans Aged 25-34, By Educational Level, 1949-2000



Source: Educational Attainment in the United States, U.S. Census Bureau, March 2000
2000 dollars (CPI-U adjusted)



A Broader Concept of Rigor:

1. **Applied learning of essential academics in reading, writing, mathematics and science**
2. **Project/problem-based learning that grounds students in the real-world use of academic knowledge**
3. **Rich contextual curriculum that enables students to reach greater depth of understanding through hands-on and minds-on learning**
4. **Program of study that joins college-ready academic core with quality CT courses in high-demand, high-wage fields**
5. **Assessments that measure students' learning of academic and technical concepts through project-based learning**
6. **A commitment to relevance that connects students to interests and goals**

Project-based learning in the CT classroom brings an authentic, motivating context to teaching career-related competencies.

May Involve:

- **Workplace simulations**
(designing, assembling and evaluating a product)
- **Developing and/or implementing a local plan to meet a local business need**
- **Operating a business in a school or community**



PBL teaches students complex processes and procedures through active engagement with complex situations.

Teachers report that PBL:

- **Bridges the gap between “knowing and doing”**
- **Encourages development of habits of mind associated with career success and civic responsibility**
- **Assess performance on content and skills similar to those used in the workplace**
- **Creates positive communication and collaborative relationships among diverse groups**
- **Meets the needs of learners with varying skill levels and learning styles**
- **Engages and motivates the typically unmotivated**

Resource: Buck Institute for Education, 2007

14

Criteria for Successful Implementation of PBL

Projects Must:

- Be central, not peripheral to the curriculum
- Focus on questions or problems that lead students to learn central concepts and principles of the CT career area
- Involve students in constructive investigation
- Be student-driven
- Be realistic workplace examples, not school-like.

15

Why is this important?

Embedding essential academics of reading, mathematics, and science into rigorous contextual, project-based CT courses provides students with meaning and purpose for school.

Finally!

Students get the answers to:

1. Why do I need to know this ?
2. Where will I ever use this ?



Keeping our Eye on the Prize!

- Forward thinking
- High-wage, high-skill, high-demand jobs of the present and the future
- Think about projects that will:
 - help students get entry-level jobs right out of high school;
 - prepare students for advancement in the field; and,
 - provide opportunities to be ready for future education and training.



What is Authentic, Real-Workplace, Project-Based Learning?



- **Large enough to cause students to acquire major technical, academic and personal skills implied in the course goals**
- **Requires completion of learning activities that result in work that would be done in a real workplace**
- **Challenges students intellectually**
- **Engages students in interacting and sharing ideas about addressing the problem and lessons learned**

Source: SREB, *Designing Challenging Vocational Courses*, 1997. www.sreb.org

- **Allows students to address problems, projects and career activities they will encounter on the job**
- **Requires students to organize information, consider alternatives and use higher-order thinking skills**
- **Requires students to apply academic skills that are most needed to advance in the field and to participate in postsecondary training**

Project Description Template

You are a ____ (*insert a real-workplace role*).

You are faced with ____ (*insert a problem*).

You must ____ (*insert what must be done to solve the problem*).

Once you have decided on a course of action, you will ____ (*insert an opportunity for presentation to an authentic audience*).

A non-example

Project Title: Soldering connects your world

Essential Question: How do you choose the correct soldering alloy?

Student Engagement Scenario: Soldering connects your world

Project Description: Take a ½ dozen different base materials and solder alloys and join materials using the soldering process. Evaluate the process for strength, connectivity as well as electrical conductivity.

Project Title: Analog load cell

Improved Example

Essential Question: How do people-made devices protect our health and safety?

Project Description: You work for a National Load Cell, INC and you have been on the job one day. Your supervisor has told you that a customer has a need for an inexpensive load cell that will fail at a certain weight. You have been asked to design an inexpensive system that will be integrated onto a platform that should the weight be exceeded the load cell will fail and will trigger an off-switch disabling the system.

Design, build and test the effectiveness of using soldered sheet metal that will fail at 200, 400 and 600 pounds. These load cells will also have built-in analog indicator that will record in 25 lb increments using lights or analog gauges. Steps in the process may include preparing and testing soldered members at a variety of widths to measure the failure weight in a dynamic testing environment. This will include the testing using a variety of soldering alloys. Assemble and analyze the data. Design and construct an analog weight monitoring system that will use the lights or gauges to monitor in real time in 25 lb increments of weight being applied. Present your findings and recommendations in the form of a written report to include the display of test samples.

Key Phrase: Design, Build, Evaluate

Key Phrase: Investigate, Conduct, Analyze

Your town just experienced an outbreak of e. coli bacteria, which made 12 percent of the adult population ill. Your job is to analyze the potential causes of the outbreak and to make recommendations regarding the prevention of future outbreaks. You will need to:

- Investigate food sources (i.e., was the food imported or produced locally)
- Investigate food production (i.e., was the food properly handled at all stages of production)
- Investigate consumption patterns (i.e., why were only adults affected by the outbreak)
- Conduct an experiment with food samples and varied production and handling methods
- Analyze the data and synthesize your information in a well-designed brochure
- Disseminate the brochure throughout your community

Project Description Criteria

■ Project Description:

- Workplace role or job title
- Authentic problem to be solved
- Identify what students will do
- Tell students how to document solutions (e.g., presentations, reports, etc.)



■ Authenticity:

- Authentic to a field?
- Prepare students for the future?
- Doable in high school?

- **Academics:** Does the project require practice of science, mathematics, and language arts skills?

The Role Team Members Will Play

■ Industry, Postsecondary and Higher Education

- Primarily responsible for coming up with the project ideas

■ English/Language Arts

- How can we write into the project description opportunities for students to read, write, speak and listen?

The Role Team Members Will Play

■ Mathematics

- How can students collect and analyze data or produce mathematical models?

■ Science

- What science investigation/lab can we write into the project description that will help students understand science concepts behind the project tasks?

Lessons Learned

1. You need the help of industry and postsecondary partners.
2. You must remember that even your best CT teachers may not be familiar with PBL as we have described it.
3. You need your academic friends.

Lessons Learned

4. Your academic friends need you too.
5. You must provide plenty of scheduled planning time for your friends.
6. Begin with baby steps.



So, where do you begin? First Model

1. Gather a team of business/industry and postsecondary partners. Establish a meeting schedule. (Use your advisory board meetings.)
2. Possible Meeting agendas:
 - a. What is project-based learning with embedded academics? Begin to develop a set of content strands the course should include.
 - b. Brainstorm a set of project-based learning units ideas that meet the course standards and content strands.

So, where do you begin?

2. Meeting agendas:
 - c. Write academic prompts into the project descriptions:
 - Writing prompt
 - Math prompt
 - Science prompt
 - d. Write prompts for 21st century skills and All Aspects of Industry.
 - e. Identify essential technical and academic learning students need in order to complete the project.
 - f. Write outline of enabling learning activities which include the academics and technical.


So, where do you begin?

2. Meeting agendas:
 - g. Write assessments—formative and summative.
 - h. Determine a way to collect data.
3. Teach the unit, collect and analyze the data.



**So, where do you begin?
Second Model**

**SREB's Eight Step Model for
Embedding Academics in CT**



SREB

**Please feel free to contact me with
questions you might have.
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**Thank you so much for the
commitment you have to creating a
vision for the future for all students!**

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