

79th Annual CITEA Foundation Conference

Tech Ed/CTE
&
Industrial Technology

Solving the Quiet Dilemma in California

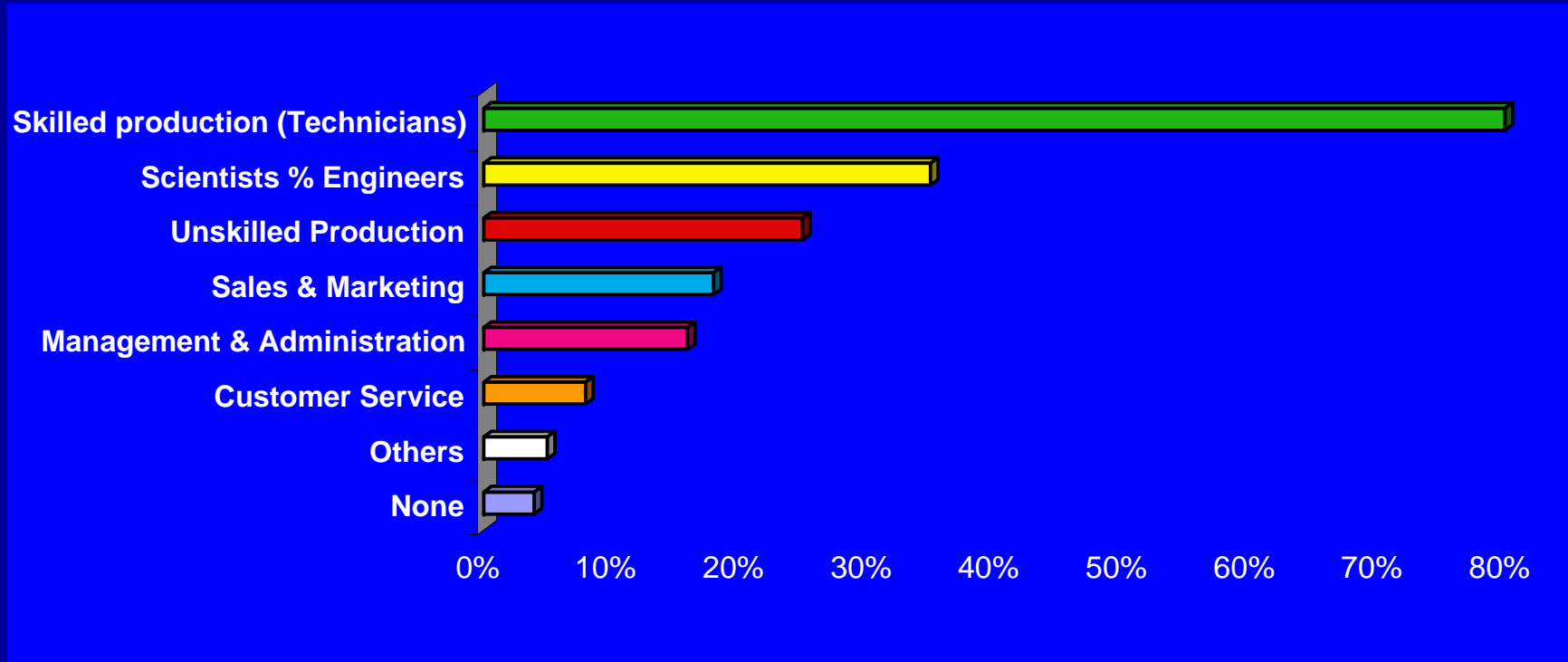
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The Quiet Dilemma

Part One

- Shortages of technically trained Workers at the
 - High school,
 - Apprenticeship,
 - Certificate/associate degree level.
- Slows economic growth
- Limits individual opportunity

What Types of Employees are Expected to Be in Short Supply Over the Next Years?



Source: "2005 Skills Gap Report: A Survey of the American Manufacturing Workforce" by National Association of Manufacturing

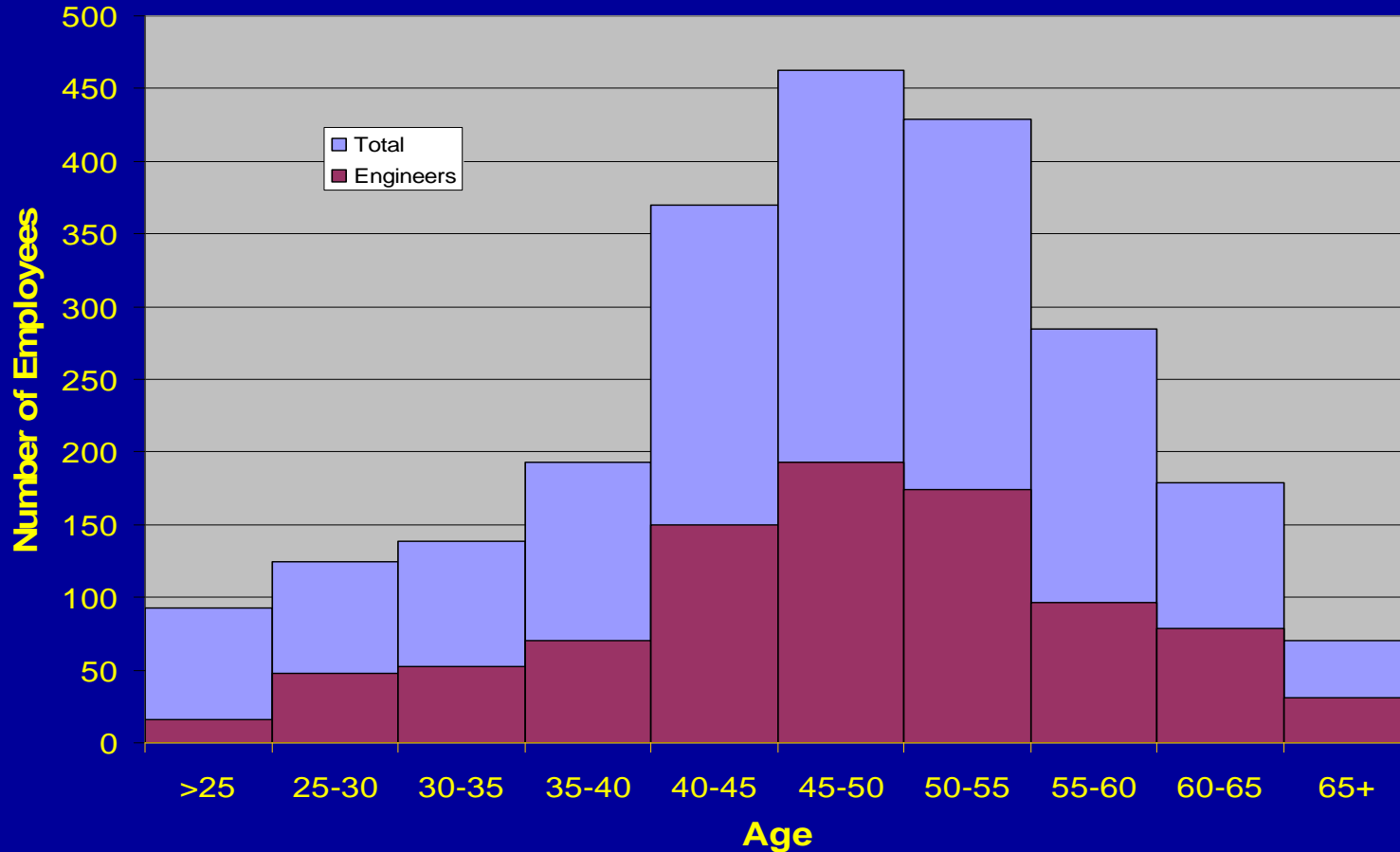
Shortages of Technicians

- There will be 100,000 more jobs for computer technicians than computer engineers.
- Carpentry trades is listed as one of the fastest growing occupations from 2006-2010.

Aerospace Career Technical Positions (partial)

- Inspector
- Technician, Electronic Research & Calibration
- Technician, Industrial Electronic Systems
- Technician, Instrumentation Controls
- Fabricator, Plastic, Senior
- Electrician, Maintenance Industrial
- Laboratory Assistant
- Mechanic, Heavy Duty Truck
- Mechanic, Solid Propellant Development
- Operator, Solid Rocket Motor
- Tool, Jig and Fixture Builder
- Technician, Vacuum Braze Furnace
- Technician, Test and Assembly
- Technician, Rocket Test "A"
- Operator, Solid Rocket Motor "A"
- Operator, Solid Rocket Motor "B"
- Technician, Primary Standards - Mechanical
- Technician, Inertial and Telemetry Systems
- Sheet Metal, Journeyman
- Process Camera Technician
- Photographer, Technical
- Photographer, Still
- Photographic Laboratory Processor
- Photo Etch Processor
- Metalsmith
- Metalsmith, Experimental
- Mechanic, Plastics
- Mechanic, Maintenance
- Mechanic, Crane
- Mechanic, Air Conditioning and Refrigeration
- Machinist, Journeyman
- Machine Operator
- Machine Tool Repairer & Rebuilder
- Inspector, Tooling
- Inspector, Radiographic/NDT
- Grinder, Tool and Cutter
- Firefighter
- Fire Service Technician
- Electro-Mechanical Bench Fabricator
- Chemical Waste Technician

Aging Technician Level Workforce



Training Needs from Job Descriptions

- Calibration Technician
 - “Must have two years of college or trade school in electronics..”
- Test and Assembly Technician
 - “High school education and/or two years of trade or technical school. Four years experience as a mechanic in the rocket/aircraft field. Airframe and powerplant license.”
- Sheet Metal Journeyman
 - “High school graduate or equivalent. Possess good working knowledge of shop mathematics and trigonometry.”
- Maintenance Mechanic
 - “High school graduate and preferably trade or vocational school training...”

Why Tech Ed/CTE Now

- Many technician level jobs will required college at the one and two year level.
- High school Tech Ed/CTE/tech prep is the main feeder into postsecondary technical education below the university level.

High School CTE & College

- Nationally, 83% of CTE students also complete an academic concentration (Plank)
- 80% of this group pursue postsecondary education within 8 years of graduating. (NCES)
- Of those pursuing associate degrees, 70% graduated. (NCES).

Economic Development

Technicians, are the key to economic growth.

Firms recruit engineers, but look to the local labor market for technicians.

Economic Development

- Availability of High School and Post-Secondary Technical Education is related to both rate of entrepreneurship and rate of return to entrepreneurship.

Goetz, psu.2007.

The Quiet Dilemma

Part Two

- High school dropouts without skills
- High school graduates without skills
- College Dropouts without skills
- College graduates without skills

The Fate of 24 Elementary School Children

- 7 drop out (29%)
- 5 graduate & go to work (30%);
of which only 22% get formal
on-the-job training.
- Dropouts & work bound = 50%

CTE and At-Risk Students

- **A combination of 60% academic courses and 40% CTE is the most effective drop-out prevention program in the American high school.**

Plank, 2002:

CTE and At-Risk Students

Compared to students with similar academic background, CTE students are more likely to

- graduate from high school**
- be employed,**
- be employed in skilled occupations**
- or be in college.**

Harvey 2001

The Fate of 24 School Children

7 drop out (29%)

5 graduate & go to work (21%)

12 Enroll in college (50%, *not 70%*)

5 Drop out (20%)

7 Graduate in five years (30%)

4 Take “gray collar” jobs, nationally (17%)

3 Win the one way to win game (13%)

University Graduates Employment 2000-2012

Supply Demand Employed

<u>University Grads</u>	1,439,264	670,000	<u>47%</u>
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*Only 13% of all jobs will require just a BA degree
(Dept of labor projections to 2016).*

Non-specific Investments in education beyond literacy will not

1. Grow the economy
2. Guarantee individual
opportunity

M. Porter

Obstacle # 1

The One Way to Win Paradigm

1. Get a four year college degree

98% agree, 72% plan on grad school

2. In order to insure economic success

Three of top 4 reasons for going to college

3. In the professional ranks

Professional/managerial 65% Technical 6%

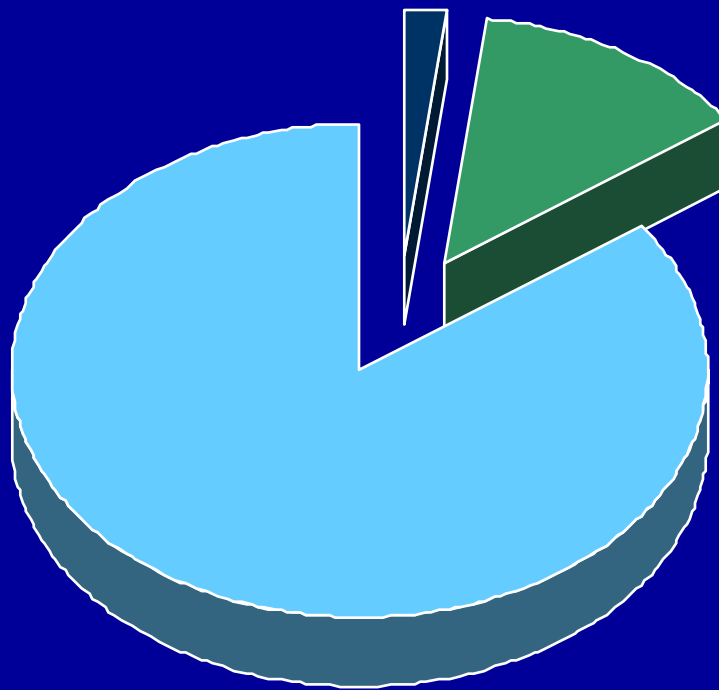
The “Other Way to Win” Message

1. The “one way to win” philosophy is nonsense. It insures the majority of teens will fail.
2. There are Other Ways to Win. Technical education is a better way for many from the academic middle. And high school CTE is the primary feeder.
3. All students should go on to postsecondary education when and if they can benefit from the experience.

Obstacle # 2 Labor Market Misconceptions.

The High Skills/High Wage Workplace

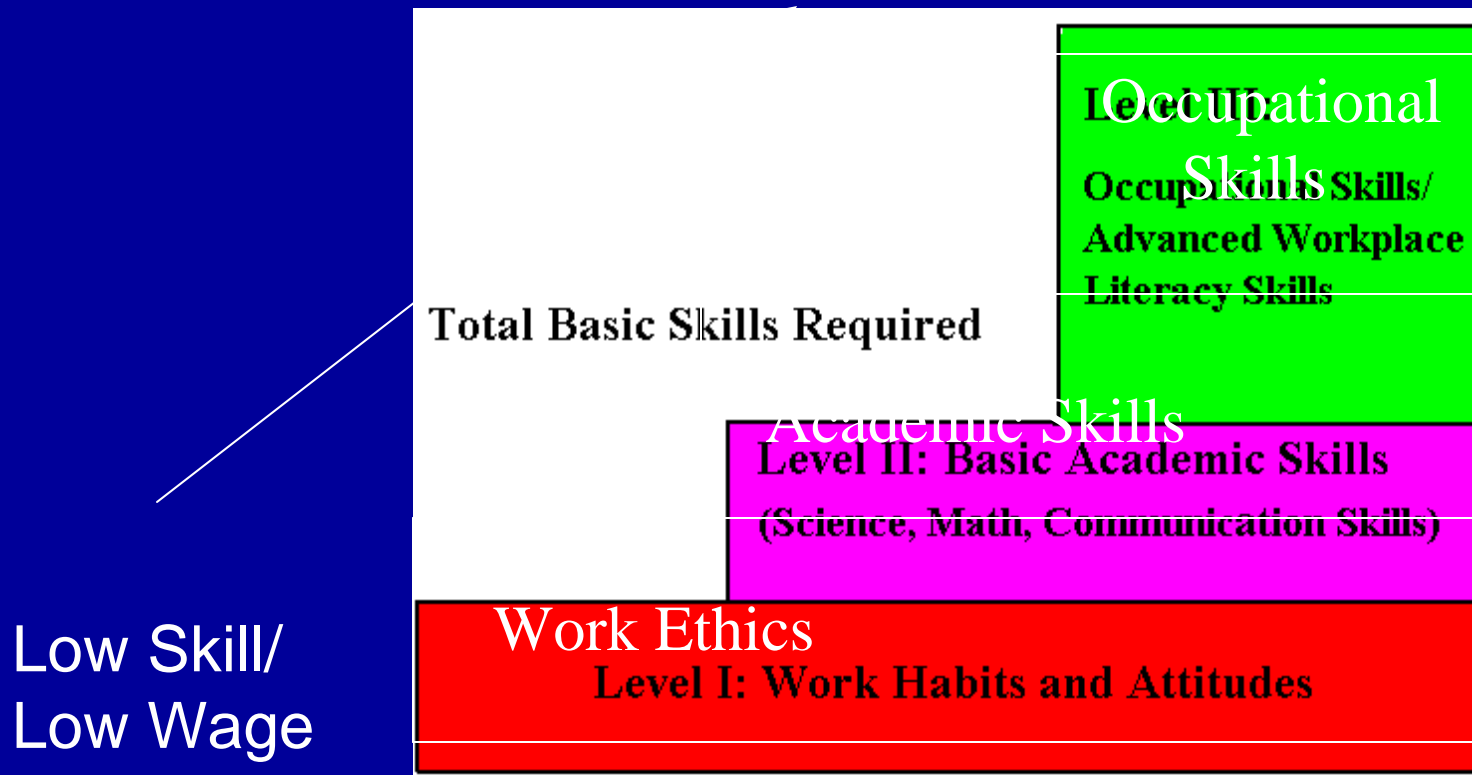
Semi-conductor Manufacturing



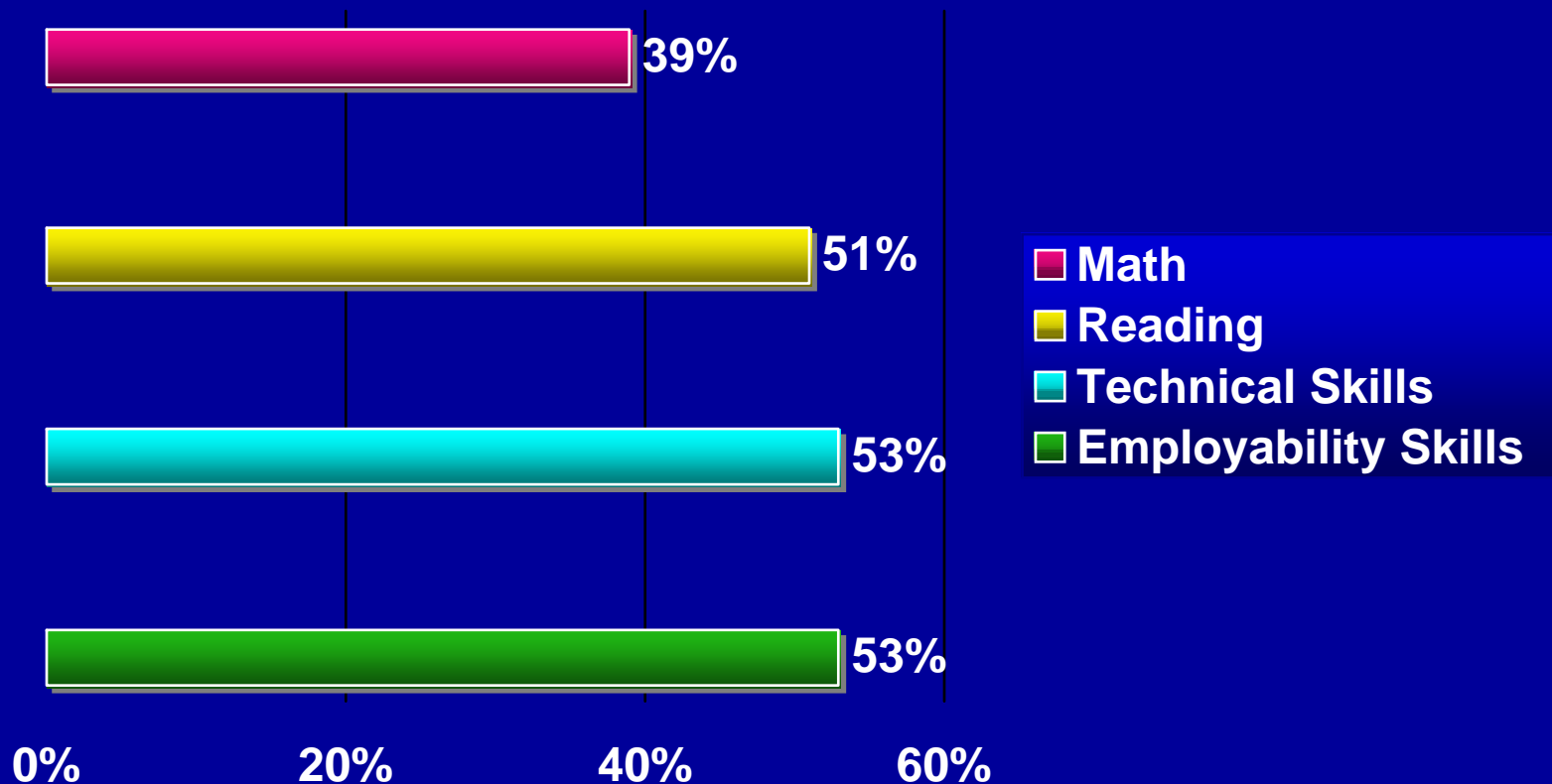
Ratio: 1 to 2 to 7

Occupational Skills -Not Degrees- Provide Labor Market Advantage

High Skill/ High Wage



Types of Skills Workers Will Need in the Future



NAM. 2006

Obstacle 3 Widespread Career Immaturity

The Need to Help Teens “Get Real”

The fact is that large numbers of CA college graduates leave school as unsure of what they will do “when they grow up” (except perhaps continue to go to school) as they were when they started.

How CA Postsecondary Education Systems Address Workforce Development (2007).

CA Postsecondary Education commission

**All my life I've always
wanted to be somebody,
but I see now I should
have been more
specific.**

Wagner, 1986

Old Advice that is now Bad Advice

- Postpone career choices as long as possible - You don't want to close any doors.
- Do not worry about career/college major indecision - you will decide that in college.

Some Final Thoughts

The
Tracking Argument

The
College Bashing Argument

The Australian Experience

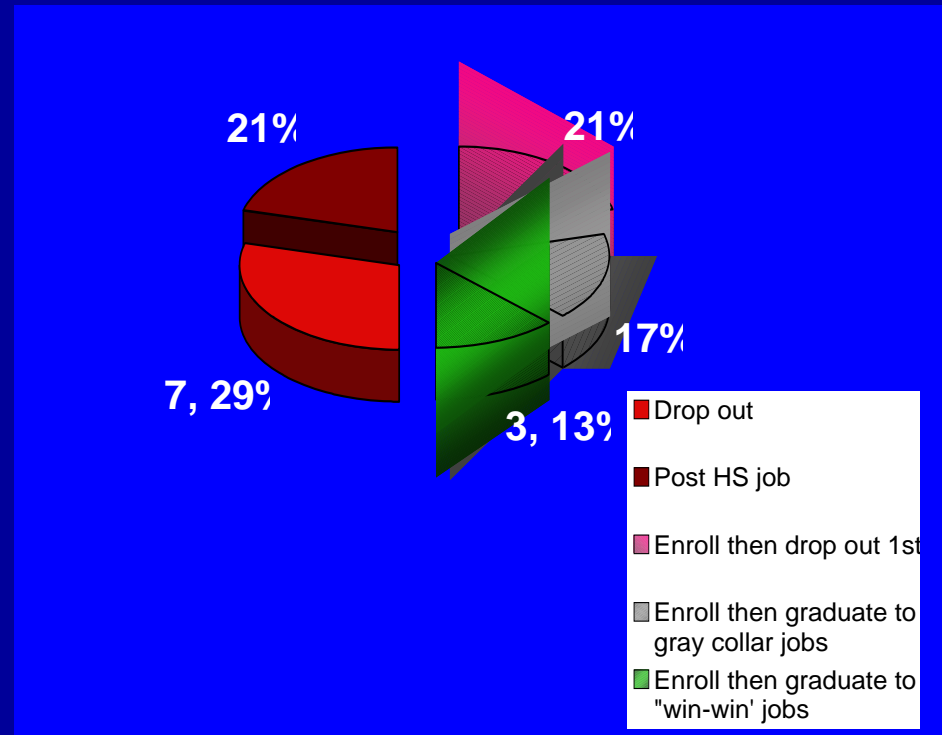
The New York City Experience

CTE
is to some teens
what
AP & Honors
is to others.

HS only

Enrolled

The Fate of 24 School Children



Why Tech Ed/CTE Now?

- Inability to Recruit
 - Too few grads
 - Fierce competition across industry
 - Don't know what is available – poor promotion by industry
 - Wrong view “manufacturing jobs are not glamorous”
 - Aerospace Industry Instability
- Training driven inside companies
 - Cannot afford to train to necessary levels; Cannot afford “not to”
 - Company paid training on employee time; low response
 - After training, employees leave
- Technical Skill Requirements more Demanding
 - Highly Sophisticated Equipment and Systems

Summary

1. About half of all teens in CA either drop out or go to work after high school graduation. CTE is the “prep” program for these teens.
2. There are Other Ways to Win. College technical education is a better way for many from the academic middle. And high school CTE is the primary feeder.
5. Non-specific investments in education do not provide opportunity nor economic growth