College and Career Ready for the 21st Century: The Critical Role for CTE

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University of Louisville
National Research Center for CTE
Context for the Conversation

- The future of jobs: Raison d'être for CTE
- How we turned HS into middle school
- Evidence of CTE’s impact on student engagement, *achievement* and *transition* to careers and college
- Building the CCR system
Why Research?

“If assumptions you hold about a problem are wrong, then it is very likely your solutions will be as well”
Starting Point for POS: The Labor Market

Three Perspectives: Worse, Worser and OMG!
The Labor Market

STEM: Let’s clarify . . .

- S&E occupations make up only about one-twentieth (5%) of all workers (5.3% in 2018), Urban Institute, 2007

- 435,000 U.S. citizens and permanent residents a year graduated with bachelor's, master's, and doctoral degrees in science and engineering. Over the same period, there were about 150,000 jobs added annually to the science and engineering workforce.

http://www.businessweek.com/print/smallbiz/content/oct2007/sb20071025_827398.htm
Is there a shortage of scientists?

Murray said that none of the companies she has talked with has suggested that there is a shortage of qualified chemists or life scientists. She said that employers’ greatest concern “is not numbers, it is training.” She cited the example of managers who told her they could interview hundreds of candidates for an organic chemistry position but wish they knew how to identify those candidates who “can behave collaboratively” and have the other broad competencies discussed at the workshop. She argued that the degree to which scientists have these other capabilities “really seems to be the problem.”

High Growth Occupations 2010-2020

- Veterinarians
- Pile-Drive Operators
- Mental Health Counselors
- Medical Scientists
- Cost Estimators
- Stonemasons
- Health Educators
- Audiologists
- Bicycle Repairers
- Dental Hygienists
- Physical Therapists
- Brick Masons
- Marriage & Family Therapists
- Market Research/Analysts
- Medical Secretaries
- Interpreters
- Glaziers
- Physical Therapy Aide
- Occ Therapy Asst
- Medical Diagnostic Tech
- Event Planners
- Plumber's Helpers
- Physical Therapy Asst
- Rebar workers
- Vet Tech
- Carpenter's Helpers
- Construction Helpers
- Biomedical Engineer
- Home Health Aides
- Personal Care Aides

Biomedical Engineers

15,700
131,000,000,000

 REQUIRED EDUCATION
HIGH SCHOOL
COMMUNITY COLLEGE
4-YEAR COLLEGE OR MORE
Another Perspective
The USA Today Version of Reality

Annual Salary

Annual Salary

- Less than HS
- HS Diploma
- Some College
- Associate Degree
- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- Professional Degree
Education and Future Work: BLS & CEW

- BS/BA or more: 23, 33
- Some College: 30, 33
- Associate: 5, 6
- Work Experience: 8
- OJT-Short to Long: 58.5
- HS or less: 36

USDOL-BLS (Blue) vs CEW (Red)
Sub-Baccalaureate Credentials Pay Off

- 43% of PS Credential Programs earn more than Associate Degrees
- 27% of PS Credential Programs earn more than Bachelor's Degrees
- 31% of all credentials & associate degrees earn more than bachelor's degree
## Middle Skill Occupations (B.A./B.S. NOT Required)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Traffic Controller</td>
<td>102,300</td>
</tr>
<tr>
<td>Storage and distribution manager</td>
<td>66,600</td>
</tr>
<tr>
<td>Transportation manager</td>
<td>66,600</td>
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<tr>
<td>Non-retail sales manager</td>
<td>59,300</td>
</tr>
<tr>
<td>Forest fire fighting/prevention supervisor</td>
<td>58,920</td>
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<tr>
<td>Municipal fire fighting/prevention supervisor</td>
<td>58,902</td>
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<tr>
<td>Real estate broker</td>
<td>58,720</td>
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<tr>
<td>Elevator installers and repairer</td>
<td>58,710</td>
</tr>
<tr>
<td>Dental hygienist</td>
<td>58,350</td>
</tr>
<tr>
<td>Immigration and Customs inspector</td>
<td>53,990</td>
</tr>
<tr>
<td>Commercial pilot</td>
<td>53,870</td>
</tr>
</tbody>
</table>

(US Department of Labor, Bureau of Labor Statistics)
Why Technical Education Matters

Credential Growth
- 0%
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%
- 45%
- 31%
- 24%
- 45%
- 43%

Labor Market Demand
- 0
- 10
- 20
- 30
- 40
- 50

College Graduate Supply
- 0%
- 5%
- 10%
- 15%
- 20%
- 25%

1970
- 0%
- 5%
- 10%

2010
- 0%
- 5%
- 10%

Taxi Drivers w/ BA/BS
Sales Clerks
Janitors

Why are recent college graduates unemployed?

Vedder, R., Denhart, C., Robe, J. (2010).
College for all? Only 40% of 27-year olds have earned an A.A. degree or higher.

What about the 60%? What about career development for the 40% college completers?
A 3\textsuperscript{rd} Disconcerting Perspective

Computers now exhibit human-like capabilities not just in games such as chess, but also in complex communication such as linguistic translation and speech (Think Siri)
A 3rd Perspective: The Race Against the Machine (The Machines are Winning?)

- The Google car(truck?)
- IBM Watson
- Deep Blue
- The “Square”
- Text readers/ Pattern recognition (goodbye legions of lawyers-only 60% accurate)
- Automated ‘call centers’ (goodbye India)
- GeoFluent (goodbye translators)
- Vending machines for ... everything
Can People Win?

- Instructional methods
- Softer skills
- Instructional focus
- The Human Advantage (for now)

- Khan Academy
- CTSOs/WBL
- Hyperspecialists, entrepreneurship
- Physicality of work
- Advanced pattern recognition
- General problem solving
- Creativity
That’s the Uncertain Reality of the Labor Market

How has education responded?
Rigor = More

A narrow curriculum
High school has become the new middle school

WHERE HAVE WE BEEN:
30 YEARS OF “REFORM”
Added the equivalent of one full year of core academics (math, science, language arts) to high school graduation requirements.

(NAEP) Reading scores have not improved or significantly declined*

(NAEP) Science scores have not improved or significantly declined*

(NAEP) math scores have remained relatively unchanged

*Depends on the starting and ending timeframe
Taking more math is no guarantee

- Only 26% of students who took Alg I, II & Geometry scored a 22 (ACT Benchmark) on the ACT exam scoring an average of 17.7\(^1\)

- **18% in PA (goal is 40%?)**

- Adding Trig increases to the average score to 19.9\(^1\)

- Not until calculus is added, does the average score exceed 22 – 5 years of high school math.

- 43% of ACT-tested Class of 2005\(^1\) who earned A or B grades in Algebra II did not meet ACT College Readiness Benchmarks in math\(^2\)

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<table>
<thead>
<tr>
<th>ACT Score</th>
<th>Level</th>
<th>ACT Standard-Associated Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-15</td>
<td>Alg I / CC HS</td>
<td>Simplify ratios</td>
</tr>
<tr>
<td>16-19</td>
<td>Alg I / CC 8th</td>
<td>Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Use rational numbers to demonstrate knowledge of additive and multiplicative inverses</td>
</tr>
<tr>
<td>20-23</td>
<td>Alg I / CC 8th</td>
<td>Set up and solve problems following the correct order of operations (including proportions, percent, and absolute value) with rational numbers (integers, fractions, decimals)</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC 8th</td>
<td>Give the domain and range of relations and functions</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC 8th</td>
<td>Evaluate functions at given values</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Apply algebraic properties (e.g., commutative, associative, distributive, identity, inverse, substitution) to simplify algebraic expressions</td>
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<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Translate real-world problems into expressions using variables to represent values</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Identify the effect on mean, median, mode, and range when a set of data is changed</td>
</tr>
<tr>
<td></td>
<td>Alg I / CC HS</td>
<td>Find the probability of a simple event</td>
</tr>
<tr>
<td></td>
<td>Geo / CC 8th</td>
<td>Identify corresponding, same-side interior, same-side exterior, alternate interior, and alternate exterior angle pairs formed by a pair of parallel lines and a transversal and use these special angle pairs to solve problems (e.g., solve equations, use in proofs)</td>
</tr>
<tr>
<td>Course/ Common Core</td>
<td>ACT Topic</td>
<td>ACT Score</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators</td>
<td>(16-19)</td>
</tr>
<tr>
<td>Alg I CC 8th HS</td>
<td>Use properties of exponents (including zero and negative exponents) to evaluate and simplify expressions</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Find rational number square roots (without calculators) and approximate irrational square roots (with and without calculators)</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Evaluate and simplify radical expressions</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Use scientific notation when working with very large or very small quantities</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Set up and solve problems following the correct order of operations (including proportions, percent, and absolute value) with rational numbers (integers, fractions, decimals)</td>
<td>(20-23)</td>
</tr>
<tr>
<td>Alg 8th</td>
<td>Identify, formulate, and obtain solutions to problems involving direct and inverse variation</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th I CC</td>
<td>Translate between different representations of relations and functions: graphs, equations, sets of ordered pairs, verbal descriptions, and tables</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Alg I CC 8th</td>
<td>Interpret data from line, bar, and circle graphs, histograms, scatterplots, box-and-whisker plots, stem-and-leaf plots, and frequency tables to draw inferences and make predictions</td>
<td>(28-32)</td>
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<td>Simplify ratios</td>
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</tr>
<tr>
<td>Alg I CC HS</td>
<td>Solve formulas for a specified variable</td>
<td>(24-27)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real-world problems</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Use cross sections of prisms, cylinders, pyramids, and cones to solve volume problems</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Find the lateral area, surface area, and volume of prisms, cylinders, cones, and pyramids in mathematical and real-world settings</td>
<td>(28-32)</td>
</tr>
<tr>
<td>Geo CC HS</td>
<td>Find the surface area and volume of a sphere in mathematical and real-world settings</td>
<td>(28-32)</td>
</tr>
</tbody>
</table>
## Career Ready Math Skills: Getting the job*

<table>
<thead>
<tr>
<th>Algebra I</th>
<th>Telecommunication Junior Technician</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nursing</td>
</tr>
<tr>
<td></td>
<td>HVAC</td>
</tr>
<tr>
<td></td>
<td>Survey Technician</td>
</tr>
<tr>
<td></td>
<td>Plumbing</td>
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<td>Automobile Technician</td>
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<table>
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<th>Geometry</th>
<th>Survey Technician</th>
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<td></td>
<td>HVAC</td>
</tr>
</tbody>
</table>

| Algebra II    | Telecommunication Junior Technician |

*Preliminary analysis, NRCCTE 2012
One solution?

Be born to smarter parents!
So, Those are the Challenges . . .

What does “average” CTE do?
To Address College & Career Readiness: Make High School Matter

Increase Engagement
- Completing HS
- Completing PS/Industry credential

Improve Achievement
- Academic
- Occupational
- Technical

Enhance Transition
- Through School
- To continuing education
- To the workplace
- To a successful adulthood
CTE Keeps Kids in School

A Survival Analysis

- CTE Participation helps students “survive” high school
- Each CTE credit taken (at 3 or more) reduces the hazard of dropping out compared to students taking less than 3 CTE credits

NS=Statistically not significant
Engagement: We have a boy problem

... but many of the people who don’t fit in are boys. A decade or so ago, people started writing books and articles on the boy crisis. At the time, the evidence was disputable and some experts pushed back. Since then, the evidence that boys are falling behind has mounted. The case is closed. The numbers for boys get worse and worse.

- By 12th grade, male reading scores are below females’
- 11th grade boys write at an 8th grade girl level
- Boys used to have an advantage in math and science, but that gap is nearly gone.
- Boys are more likely to have discipline problems
- Boys account for ¾ all D’s and F’s
- Men are a minority in college (40%)
- 2 million fewer men graduate from college over the past decade than women
- Grad school gap is even higher

David Brooks, NYT July 5, 2012
CTE Keeps Boys in School!

A Survival Analysis

- CTE Participation helps boys “survive” high school
- There is no CTE “survival” effect for girls; but it “does no harm”
Why is this important?

- Lower lifetime earning
- Increased risk they will never engage in sustained full-time employment
- 6.1 million NEETs in the U.S. = $100 billion annual cost to U.S. taxpayers
- There are the social & emotional costs that are beyond dollars
- Higher risk of social conflict...look to Spain

McKinsey Global Institute, March 2012
 Teens and Young Adults have been hit the hardest by the Great Recession

54.3% of 18- to 24-year-olds (54.3%) were employed in 2011, compared with 62.4% in 2007, a 13% decrease. The lowest employment-to-population ratio for young adults since 1948.

Pew Research Center, 2012. *Coming of Age, Slowly, in a Tough Economy*
Not Just Our Work: Economists’ Perspective

“There is one approach that does tend to improve graduation rates and labor market earnings, especially for at-risk youth: high-quality career and technical education (CTE)”

CONSIDER WHAT IS REQUIRED FOR THE WORKPLACE OF TOMORROW
Getting students ready for careers and college: Their future

**Academic**
- Mathematics
- Science
- Communications

**Technical**
- Job specific skills valued by employers

**Occupational**
- SCANS
- 21st Century Skills
- “Soft” Skills
- Employability Skills

**College & Career Ready**

**Required skills**
Industry Knows This:

**Next Generation**

Skilled Team Member

- **Totally Multiskilled**
  - Electrical
  - Fluid Power
  - Mechanical
  - Fabrication

- **Strong Math Skill**
  - Upper 1/3 nationally

- **Strong Reading Skill**
  - 12th Grade level

- **Fast Technical Learner**
  - Can learn, apply, improve, and learn again

- **Uses and Learns With Digital Media**

- **Strong Problem Solver**

- **Effective Verbal & Written Communicator**
  - Comfortable in group and one-on-one situations
  - Develops high quality process manuals, guides

- **Effective Interpersonal Skills**

- **Natural Teamworker**

- **Qualified for the Next Level**

**Target:**

100% of Maintenance Workforce
To be college ready: What college, what skills?

- Trade/Technical School?
- Apprenticeship?
- Community College?
  - Certificate? Diploma? Degree-Selective or not?
  - Nursing
  - Allied health
  - Law enforcement
  - Engineering technology
  - Computer technology
  - Cut scores?
- Baccalaureate College?
  - MN College Readiness Benchmarks set by ACT: an 18 in English, 22 in Math, 21 in Reading, and 24 in Science.
  - Only 32% of Minnesota’s 2009 ACT-tested graduates met all four
Too Many College Grads?

• ...turning out vastly more college graduates than there are jobs in the relatively high-paying managerial, technical and professional occupations to which most college graduates traditionally have gravitated.

• Roughly one of three college graduates is in jobs the BLS says require less than a bachelor's degree.

• ... College graduates, on average, are smarter and more disciplined and dependable than high-school graduates—so much of the reported earnings differential has little to do with college learning.

• We have engaged in massive and costly credential inflation to certify competency for jobs.

Richard Vedder, director of the Center for College Affordability and Productivity WSJ 6/21/2012
Not Enough College Grads?

By 2020, our research projects that the United States may have 1.5 million too few workers with college or graduate degrees and 6 million more without a high school diploma than employers will demand. McKinsey Global Institute, 2012
What Occupational Skills?

### Non-Cognitive
- Deal with setbacks
- Stay on track
- Consistency
- Easily distracted
- Hard worker
- Persistence
- ‘Stick-to-it tivess’
- Diligence

### Employability
- Teamwork
- Oral & written skills
- Professionalism
- Ethics
- Creativity
- Problem solving
- Ethics
- Systems knowledge
- Responsibility

Duckworth, 2011 “Grit”

SCANS, 21st Century
What technical skills?

- Immediate specific job skills*
- Industry certifications
- 132 available through HS programs (n=14 states)

* Learning for jobs (OECD)
Engaging Students through Career Development

**K-5: Career Awareness**
Introduction to health careers

**6-8: Career Exploration**
Discovering interest in health careers - Begin Individualized Graduation Plan

**Grade 8: Transition**
Choosing a health career focus (can change easily at any time later)

**9-12: Career Preparation**
Academics and technical courses, intensive guidance, individual graduation plans

**Postsecondary: Career**
Achieving credentials: college, certification, apprenticeship, military

**Employment: Career Advancement**
Continuing education and lifelong learning

A Developmental ACP that Drives Program Choice & Student Course Assignments
Pedagogic Tools for World Class CTE

- Classroom instruction
- Project based learning
- Contextualized learning
- Labs
- Shops
- Job shadowing
- Internships
- School-based enterprise
- Cooperative education
- Apprenticeships
- Leadership development
- Professional development
- Service/social engagement
- Competitive events

- Work based learning-WBL
- CTSOs
Curriculum Integration
Experimental Research

(Instructional)

- Math-in-CTE: complete
  - Technical Assistance – 7 yrs

- Literacy-in-CTE: complete
  - Technical Assistance – 2 yrs

- Science-in-CTE:
  - Study recently concluded
Math-in-CTE - A study to test the possibility that enhancing the embedded mathematics in Technical Education coursework will build skills in this critical academic area without reducing technical skill development.
What We Learned:
Experimental Test of Math Integration

- Students in the experimental classes scored significantly higher on Terra Nova and Accuplacer
- The effect: 71\textsuperscript{st} percentile & 67\textsuperscript{th} percentile
- No negative effect on technical skills
- 11\% of class time devoted to math lessons
The Occupational Expression of Academics

A career ready person is proficient in the core academic subjects, as well as in technical topics. This foundational knowledge base includes competence in a broad range of academic subjects grounded in rigorous internationally benchmarked state standards... Career Readiness Council 2012

Math-in-CTE Curriculum Map: Health Science

<table>
<thead>
<tr>
<th>CTE Course/Unit</th>
<th>CTE Concepts</th>
<th>Math Concepts</th>
<th>Common Core Math Standards Middle School</th>
<th>Common Core Math Standards High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient assessment</td>
<td><strong>Input/output; Vital signs; Height/weight; Conversions; Instrument reading</strong></td>
<td><strong>Reading measurement; Basic operations; Ratio/Proportion; Solving equations; Scales</strong></td>
<td>6.NS.2; 6.NS.3; 7.NS.1; 6.RP.1; 6.RP.2; 6.RP.3; 6.RP.1; 6.RP.2; 7.RP.3; 6.EE.2; 7.EE.3</td>
<td>A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; A.CED.4</td>
</tr>
</tbody>
</table>

http://www.nrccte.org/professional-development/math-cte/curriculum-maps
Experimental Test of Reading Interventions in CTE

- Significant improvement from both approaches
- Teachers with two-years experience in method had greater effect

Two approaches tested
Improved reading skills
Tools for College & Career Readiness

- Classroom instruction
- Project based learning
- Contextualized learning
- Labs
- Shops
- Job shadowing
- Internships
- School-based enterprise
- Cooperative education
- Apprenticeships
- Leadership development
- Professional development
- Service/social engagement
- Competitive events

- Work based learning - WBL
- CTSOs
WBL: Everywhere but in the U.S. . . .

- The % of youth in VET ranges from 5% (Ireland) to 80% (Czech Republic).
- More than 50% youth in VET: Austria, Belgium, Finland, Switzerland, Australia, Germany, Sweden, Denmark and others.
- Japan, United Kingdom, France, Korea and others exceed 20%
- The U.S. doesn’t make the list!

*Learning for jobs (OECD, 2010)*
The Value of WBL

Nations enrolling a large proportion of upper-secondary students in vocational programs that include heavy does of WBL have significantly higher:

- school attendance rates
- higher upper-secondary completion rates
- college attendance

Bishop & Mane, 2004
Pedagogic Tools for World Class CTE

- CTSOs
- Leadership development
- Professional development
- Service/social engagement
- Competitive events
### The CTSO: Building Occupational Skills

<table>
<thead>
<tr>
<th>Function</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive Events</td>
<td>Academic Engagement</td>
</tr>
<tr>
<td>领导力发展</td>
<td>College Aspirations</td>
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<tr>
<td>专业发展</td>
<td>Grades</td>
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<td>社交活动</td>
<td>Career Efficacy</td>
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<td>无效应</td>
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<td>(-)职业期望</td>
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<td></td>
<td>就业期望</td>
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<tr>
<td></td>
<td>职业效能</td>
</tr>
</tbody>
</table>

(Alfeld, et al, 2007)
Beyond Curriculum & Pedagogy

Building a CCR System
What is a POS?

Incorporate secondary education and postsecondary education elements;

Coherent and rigorous content in a coordinated, non-duplicative progression of courses that align secondary education with postsecondary education . . . to adequately prepare students to succeed in postsecondary education;

May include dual or concurrent enrollment programs;

Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.
Research Points toward:

**System**
- Vertical Alignment, “Articulation”
- Industry & Education Partnerships
- Career Clusters/Pathways
- Dual Credit/Enrollment

**Programmatic**
- Incorporate more academics into CTE
- Incorporate more CTE into Academics
- Career Academies/MCHS/TCTW

**Curriculum/Instructional**
- CTE to Academic & Academic to CTE
- Pedagogic framework; Signature Features (SREB, Liked Learning)
- Teacher skill/performance
An Industry Driven POS-Toyota

THE SKILL PIPELINE PROBLEM

The U.S. community college system produces less capable graduates than parallel systems in competitor nations

Intentional preparation consists mostly of academic education only, i.e. pass technical courses and get a degree.

Schools do not produce graduates with vital preparation for workplace success, such as a highly developed safety culture, skills in workplace organization, lean work skills, and problem solving.
The Toyota Solution
Seamlessly Connect Paths for Career Long Growth
and to Strengthen the Whole Company

TOYOTA
Advanced Manufacturing
Career Paths

TOYOTA Maintenance Career
TOYOTA Seibi Career
Org Mgt. Seibi Mgt. Seibi Tech

Toyota Maintenance Internship
Toyota Advanced Program

Automotive Manufacturing
M.B.A.

Lean Manufacturing Certificate

Manufacturing Management Program
B.B.A., A.B.

TOYOTA Engineering Career
Production Engineer
TEMA

NED
New Engineer Development

AME
Advanced Manufacturing Engineering Program
Electrical / Industrial Mechanical
B.S.

AMT
Advanced Manufacturing Technician Program
Special Toyota Degree Program
100% Toyota Relevant

K-12

Project Lead the Way

* 6 mo. – 2 years
* Full-time floor experience

Robotics
Programmable Controls
Line Controllers
Vision system
Troubleshooting
The Solution
Totally Redesign the Learning Environment

The New Model School
For Manufacturing

MORE REALISTIC
Looks Like a Factory
Feels Like a Factory

MANUFACTURING SIMULATOR
Central Focus
Reason for Learning
Toyota Troubleshooting

TOYOTA LEARNING
Safety, TPS, 5S
Learning Lab

ORGANIZED BY
FUNDAMENTAL SKILL
Electricity / Fluid Power
Mechanics & Fabrication

PROCESS LEARNING
Students learn in a
structure sequence

Students Learn the Right Way the First Time

Make the
Place of Learning
look and feel like the
Place of Work
Key Elements for POS (OVAE, DOL, CLASP)

- Partnerships
- Labor market demand focused balanced with individual focus (career development)
- Alignment – policies, measures, education programs
- Integrated, contextualized curriculum
- Industry Recognized (stackable) credentials
- Professional development
- Data driven: continuous improvement & accountability
Emergent trends

- Some evidence of academic achievement effect, but the evidence is mixed

- Career guidance/career development is a necessary condition for CCR

- Mandate did not appear to have much effect on POS implementation (e.g., % of students engaged in POS, use of dual credit)

- 10 OVAE elements are not equally important or too costly to employ (e.g., TSA)

- Other elements may be more important (e.g., external funding)
“There is one approach that does tend to improve graduation rates and labor market earnings, especially for at-risk youth: high-quality career and technical education (CTE)”

The good news: This is CTE’s Time

Career & Technical Education

Programs of Study/Career Pathways

College and Career Ready

High Quality CTE PFT
Key points

- Secondary CTE keeps kids in school, especially boys
- High quality, secondary CTE enhances academic achievement; can support CCSS; improves transition to postsecondary-Necessary for College and Career Readiness
- Effective CTE requires intensive and extensive career development beginning no later than middle school
- Effective CTE requires effective teachers; professional development
- Effective CCR preparation requires a systems approach:
  - Vertical integration: high school & postsecondary & employer
  - Horizontal integration: academic & CTE; CTE & academic
  - Internal integration: authentic, contextualized learning
Shameless Promotion . . .

College and Career Ready in the 21st Century

Making High School Matter

James R. Stone III • Morgan V. Lewis
VISIT OUR WEBSITE OR SEND ME A NOTE

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