



Institute for
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UNIVERSITY OF WISCONSIN-MADISON

Can Career & Technical Education Improve Student Outcomes?

Shaun M. Dougherty

November 6, 2019

Webinar begins at 2pm EST/1pm CST/12pm MST/11am PST



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Transitions to Adulthood Network
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Situating current policy context for CTE

- A lot is happening, but we still have limited evidence of impacts
 - Policy interest in CTE has increased in the last decade
 - ESSA reauthorization of ESEA (2015)
 - Focus on college & career readiness
 - Associated accountability plans & measures
 - Perkins reauthorization (2017)
 - States actively planning
 - New expectations about measurement
 - Goals complement ESSA requirements
 - Increased focus on program alignment with labor force needs
 - Emphasis on adoption of credentials and certificates
 - Continued challenges with teacher recruitment and retention
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History in Brief

- Current CTE emerges from more than 100 years of evolution in the US public schools
 - Morrill Act of 1862 – Agriculture & mechanic arts
 - Smith-Hughes Act of 1917 – brings it into primary & secondary ed.
 - Longstanding debate about role of public education
 - Pragmatic – school for work
 - Democracy – school for informed community
 - Education for its own sake
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CTE: Who participates & how?

- Career and technical education participation is common in high school. 20% take 3 or more HS courses in a single program.
- 16 Career Clusters
- 80 programs of study



Source:

<http://www.connectionnewspapers.com/photos/2017/jun/28/118174/>

Measuring CTE exposure

- CTE first introduced in middle school
 - High schools offer:
 - Classes
 - Concentration: multiple aligned classes in single pathway
 - Work-based learning/professional certifications
 - Career-tech student organizations (CTSOs)
 - College
 - Includes dual enrollment or early college
 - May include transition plans or articulation agreements
 - Certificates, credentials (stackable)
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What are the big questions?

1. What benefits does CTE provide to high school students?
 2. Should CTE be a path to college? If so, for everyone?
 3. What CTE programs should be offered? Who decides, how, and when does it change?
 4. What models of CTE have been shown to be effective, on what outcomes, and for whom?
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Benefits to CTE

1. What benefits does CTE provide to high school students?

- Engagement in high school (content & social)
 - Skill development for employment
 - Familiarity with aligned college programs
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CTE & Postsecondary education

2. Should CTE be a path to college? If so, for everyone?

- For some students, completing high school remains a substantial challenge
 - Not everyone knows what to study or how to choose well
 - Yet, clear returns to college degrees and certificates
 - Key policy concern is avoiding unnecessary & unrewarded debt
 - Need to emphasize that immediate enrollment is not necessarily the most important outcome
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Aligning CTE offerings

3. What CTE programs should be offered? Who decides, how, and when does it change?

- Changes in local labor markets should be reflected in changes in CTE offerings
 - Balance between general skill development & clear occupational demand
 - Good opportunity for coordination: employers, schools, WIBs, other stakeholders
 - However, program changes are expensive and require equipment and staffing changes that may pose challenges
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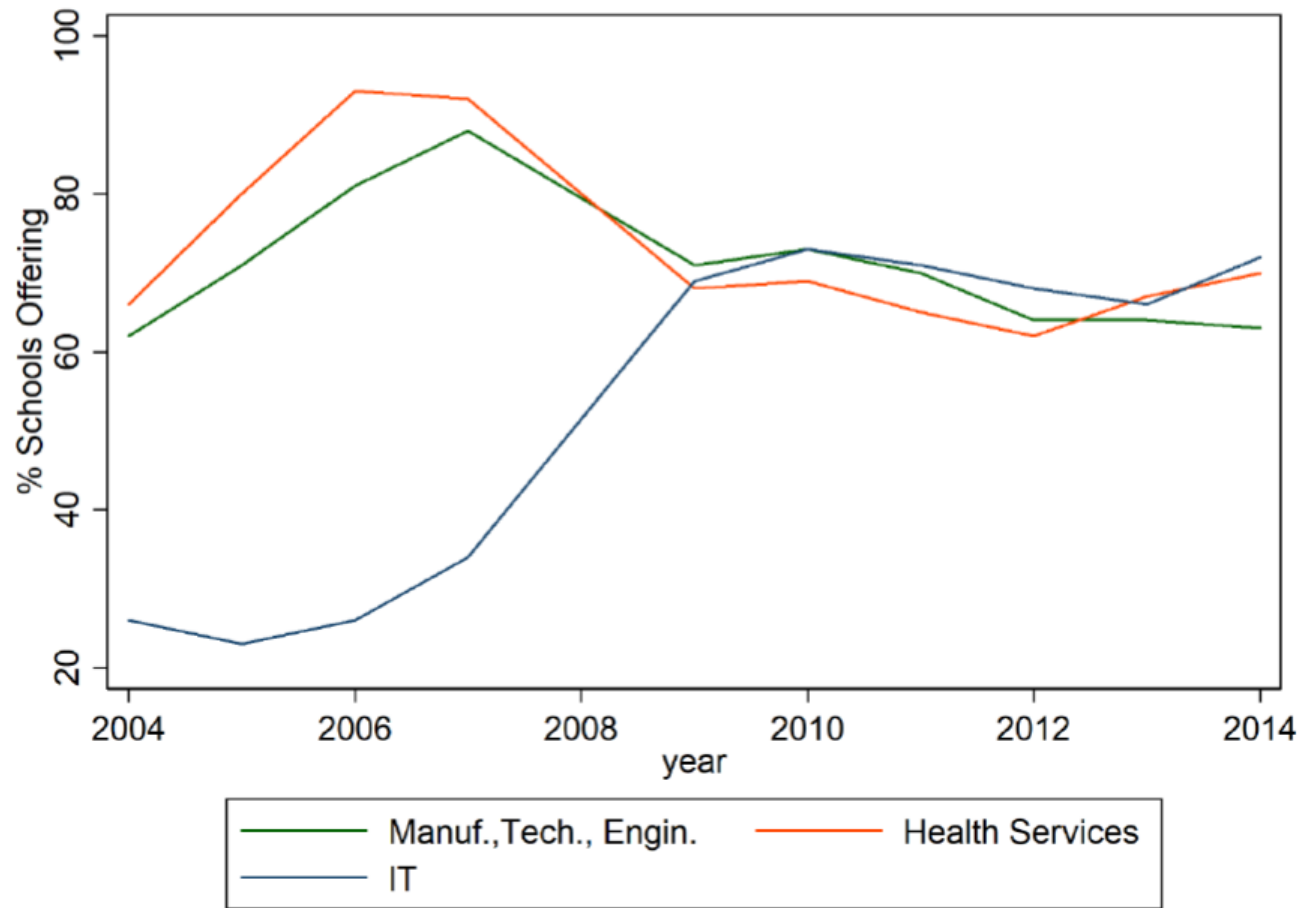
When is CTE effective?

4. What models of CTE have been shown to be effective, on what outcomes, and for whom?

- Limited causal evidence, but most comes from whole school models
 - Career academies (Kemple & Wellner 2008; Hemelt, Lenard, Paepflow, 2019)
 - Emerging evidence of positive impact on high school completion
 - Brunner, Dougherty, & Ross 2019; Dougherty 2018; Gottfried & Plasman, 2018; Hemelt, Lenard, Paepflow, 2019
 - College evidence is mixed, mostly suggests null or negative effects, maybe increase in CC participation
 - Cellini 2006, HLP 2019, BDR 2019
 - Clear evidence of positive effects on workforce outcomes
 - Most CTE in HS happens in comprehensive high schools or part-time technical centers where we have limited evidence
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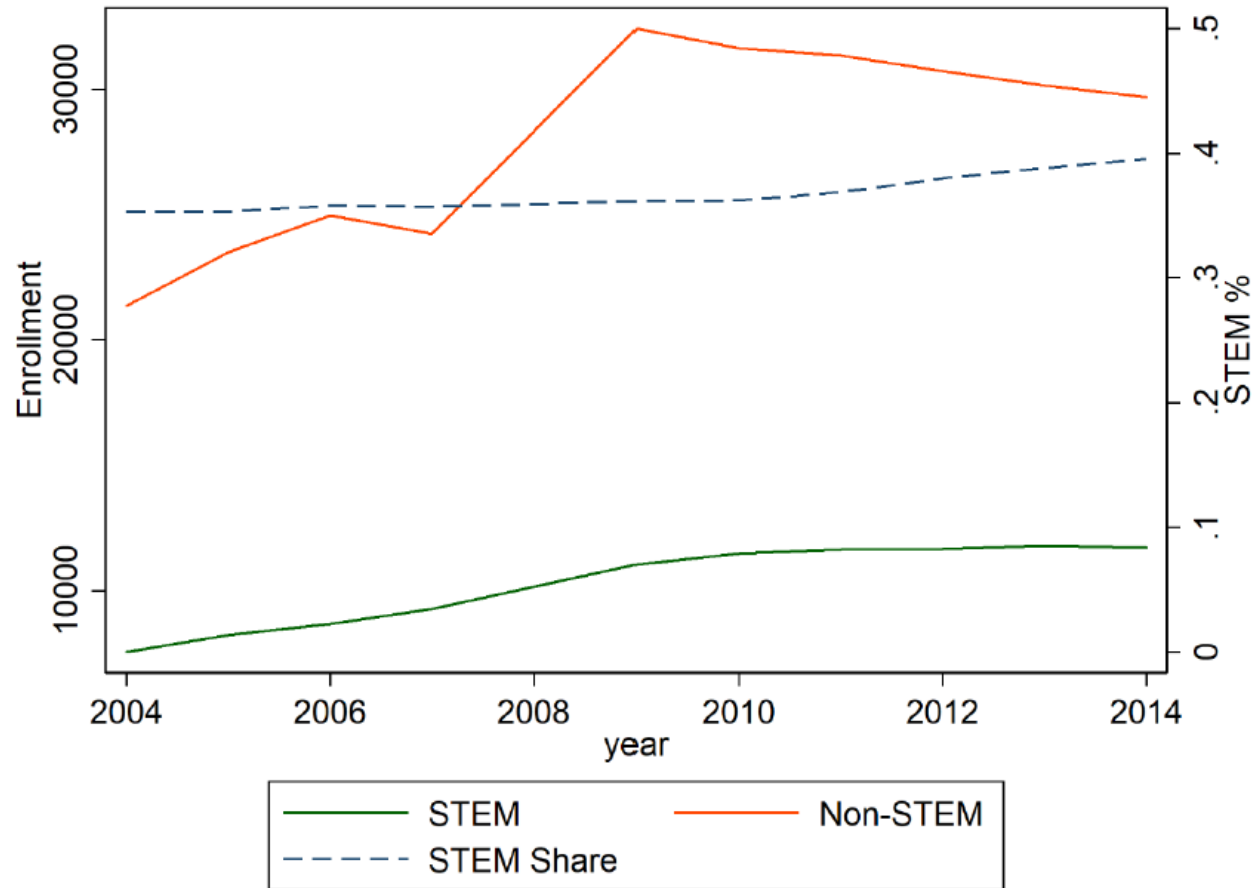
CTE Changing over time: Massachusetts

Figure 1. Trend in proportion of schools offering CTE programs in focal STEM fields.



STEM on the rise?

Figure 2. STEM and non-STEM Growth in Student Participation.



Other emerging evidence

- Financial investments can change outcomes
 - California competitive grants (Bonilla, 2018)
 - High school graduation (+)
 - Michigan funding change (Goldring et al. 2018)
 - Modern Career Academies still impactful
 - High school graduation (+)
 - Hemelt, Lenard, Paepflow (2019)
 - Evidence from NC
 - Clear returns to program participation
 - Wages & college going in Tennessee
 - Carruthers & Attridge (2018)
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What can we learn from the evidence?

- Evidence of improved outcomes when:
 - Whole-school models
 - Increases in spending
 - Reforms to offerings
 - Earnings benefits are consistent with longstanding causal and descriptive evidence.
 - Some evidence of gender differences
 - Career Academies and Connecticut
 - Wage benefits only for boys
 - California pathways
 - suggestive differences in dropout possibly related to health service pathways
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Potential mechanisms

- Graduation
 - Programs align with student interests
 - Enhance engagement/ relevance of work
 - Mentoring and peer networks (tighter)
 - Self-efficacy in technical work spills over into core graduation requirements
 - Workforce
 - Practical and relevant skills
 - Work-based learning experiences
 - Development of social skills for employment
 - College going
 - Highlights aligned pathways
 - Adds nuance to older 4-year college for all approach
 - Emphasizes variation in timing of college investments
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Measuring CTE impacts/outcomes

- What CTE should affect depends, partially, on how you interpret the role:
 - Wages & employment
 - Transitions to postsecondary training
 - Learning & school completion
 - May be more salient for specific student groups:
 - Those less likely to enroll in college
 - Students from lower-income families
 - Students with disabilities based on transition plans
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Challenges ahead

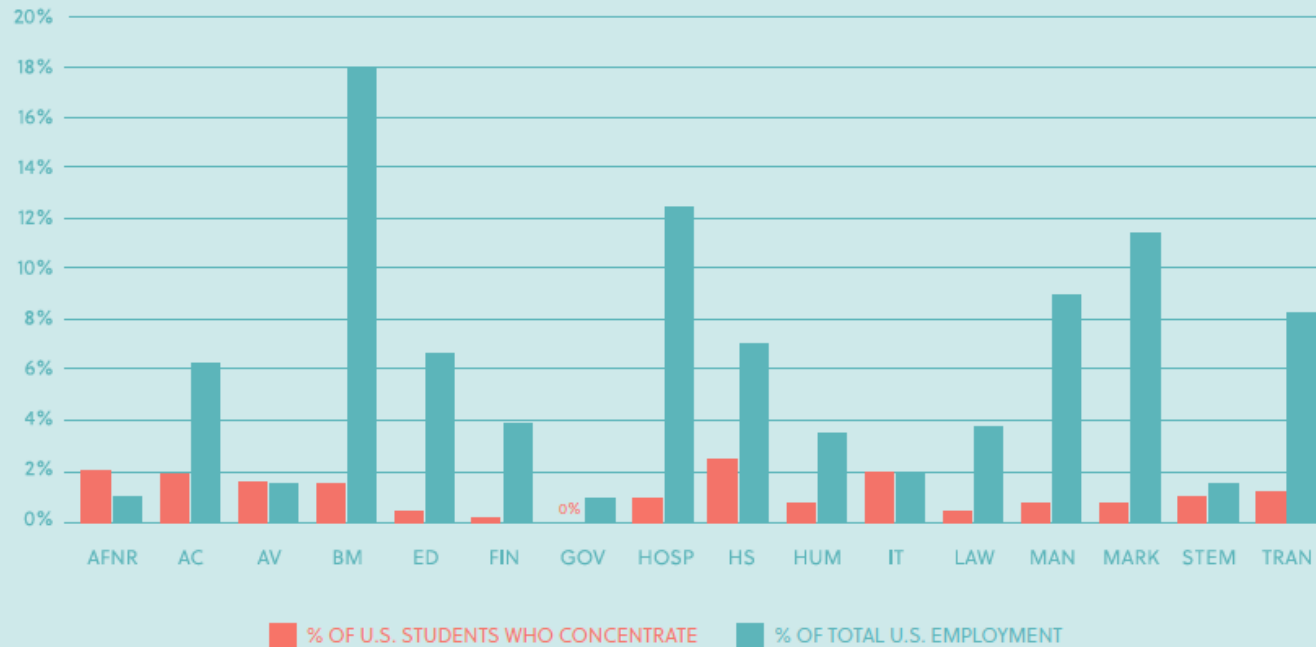
- Teacher workforce
 - Program alignment with labor needs
 - Ensuring quality and value
 - Persistent questions about stigma & college pathways
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CTE: Who teaches?

- States vary in requirements to teach
 - Generally involves
 - Multiple years of industry experience
 - Initial screening to provide a provisional license
 - Turnover has been estimated as slightly higher than among academic subject teachers
 - Constitute a hard-to-staff segment of teacher workforce
 - Face better private sector options
 - Get less formal training to teach
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CTE as workforce development?

FIGURE ES-1 Only two fields have concentration rates that exceed their national employment shares.



AFNR Agriculture, Food & Natural Resources
AC Architecture & Construction
AV Arts, A/V Technology & Communications
BM Business Management & Administration
ED Education & Training
FIN Finance

GOV Government & Public Administration
HS Health Science
HOSP Hospitality & Tourism
HUM Human Services
IT Information Technology
LAW Law, Public Safety, Corrections & Security

MAN Manufacturing
MARK Marketing
STEM Science, Technology, Engineering & Mathematics
TRAN Transportation, Distribution & Logistics

Opportunities to learn

- Trend towards increased emphasis on CTE
 - Every Student Succeeds Act bridges
 - College for all => College & career readiness
 - ESSA & Perkins plans will further alter the CTE landscape
 - Extension of state longitudinal data systems presents further opportunities to understand impacts
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Resources & research

Career and technical education (CTE) teaches students knowledge and skills to prepare them for credentials and careers, but more rigorous research on the impact of CTE is needed.

Our mission: The CTE Research Network is expanding the evidence base by promoting CTE impact studies and strengthening the field's capacity to conduct and use CTE research. We carry out this work through **research, training, coordination,** and **dissemination.**

Visit us at cteresearchnetwork.org

- **Follow** us on Twitter and LinkedIn for our latest research updates and news
- **Sign up** for our mailing list to receive our newsletter and announcements

The work of the CTE Research Network Lead is supported by the Institute of Education Sciences at the U.S. Department of Education with funds provided under the Carl D. Perkins Career and Technical Education Act through Grant R305N180005 to the American Institutes for Research (AIR). The work of the Network member projects is supported by the Institute. The opinions expressed are those of the authors and do not represent the views of the Institute or the U.S. Department of Education.

CTE | **RESEARCH
NETWORK**

More resources and ongoing research

- CTE Exchange (CTEx)
 - <https://gpl.gsu.edu/ctex/>



- MDRC
 - <https://www.mdrc.org/project/mdrc-center-effective-career-and-technical-education#overview>



Policy Implications

- Program updates to ensure alignment with labor market need
 - Structures to ensure student engagement & access
 - Attracting and retaining teachers in high-demand and high-wage fields
 - Pathways to certification
 - Competitive wages
 - Understand the value of certifications and credentials
 - Aligned pathways between HS and PSE
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Thank you

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Q&A, other CTE resources

[Slides from today's presentation](#)

Brief: [Ensuring Equity in Evolving High School Career and Technical Education Policies](#) *Fast Focus* No. 42-2019, August 2019

Brief: [What do we know about Career and Technical Education?](#) *Fast Focus* No. 38-2019, April 2019

Workshop Agenda & Presentations from the: [2019 Career & Technical Education: Promise and Practice Workshop](#)