ATE Targeted Research in Action: FLATE/PathTech and Fox Valley/METTE Partnerships to Improve Student Outcomes

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Introductions: PathTech Team and METTE Team

Workshop Overview

The ATE Targeted Research Priority

Why Targeted Research on Technician Education Matters

- The National College Completion Agenda
- State Level Performance Funding (WI and FL)
- Local college initiatives (FVTC)
  - Strategic Planning
  - Program Improvement and Performance Scorecards

To focus our remarks: What information, if available, would be most useful for improving ATE student success or outcomes?

Mixed Methods Research Design

- Quantitative
  - Education and employment administrative data
  - Institutional, state, and national public and private data sources
  - Study transition from high school and the workforce into advanced technologies
  - Study short-term and long-term post-schooling outcomes

- Qualitative
  - Interviews and focus groups
  - College students, faculty, and administrators
  - High school students and personnel
  - Employers and key stakeholders

METTE

PathTech
Successful Academic & Employment Pathways in Advanced Technologies

NSF

Successful Academic and Employment **Path**ways in Advanced **Tech**nologies

- ATE Center/University Partnership
- FLATE Regional Center of Excellence/University of South Florida (Tampa, FL)

- Pathways Research
- PathTech Collaborative Research Model

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Hillsborough Community College (Tampa)

- Advanced Manufacturing

HCC

St. Petersburg College (Clearwater)

- Biomedical Systems, Quality, Digital Design & Modeling

St. Petersburg College SPC

Polk State College (Lakeland)

- Advanced Manufacturing

POLK STATE COLLEGE

State College of Florida (Venice)

- Electronics, Digital Design & Modeling

SCF STATE COLLEGE OF FLORIDA MANATEE AND SARASOTA COUNTIES

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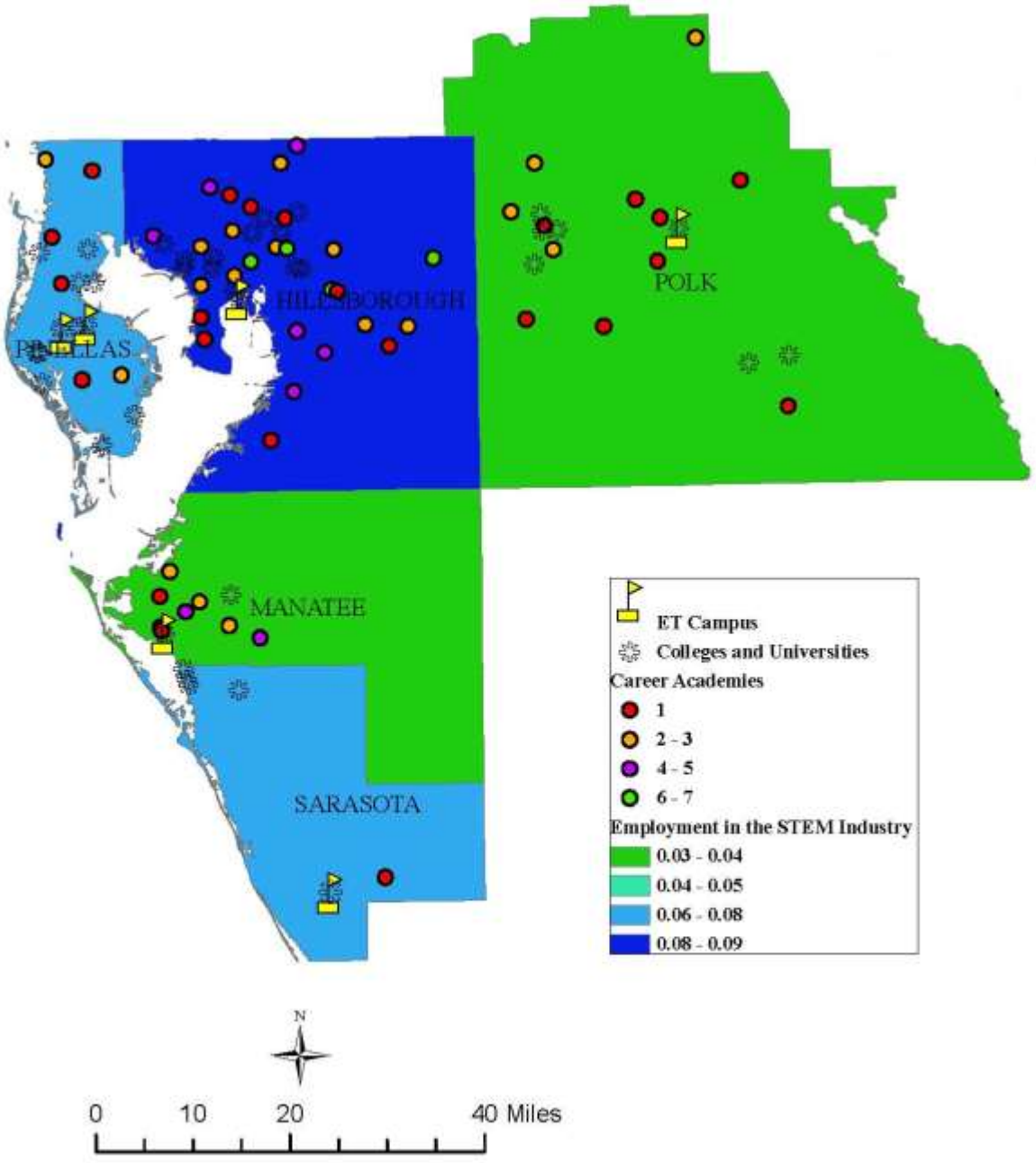
FLATE Engineering Technology College Network

- FLATE connects USF researchers to Tampa Bay area ET community
- ET students
- ET graduates
- High school career academies
- Industry partners



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Improving Educational Outcomes in **M**anufacturing **E**ngineering **T**echnologist and **T**echnician **E**ducation

- Research and Innovation Partnership to Improve Student Success
- Five Partners: UW-Madison, FVTC, MATC-Milwaukee, MPTC, and WCTC
- Student Success Model
- Research and Innovation Framework

Fox Valley Technical College

MATC

Moraine Park Technical College

WCTC Waukesha County Technical College

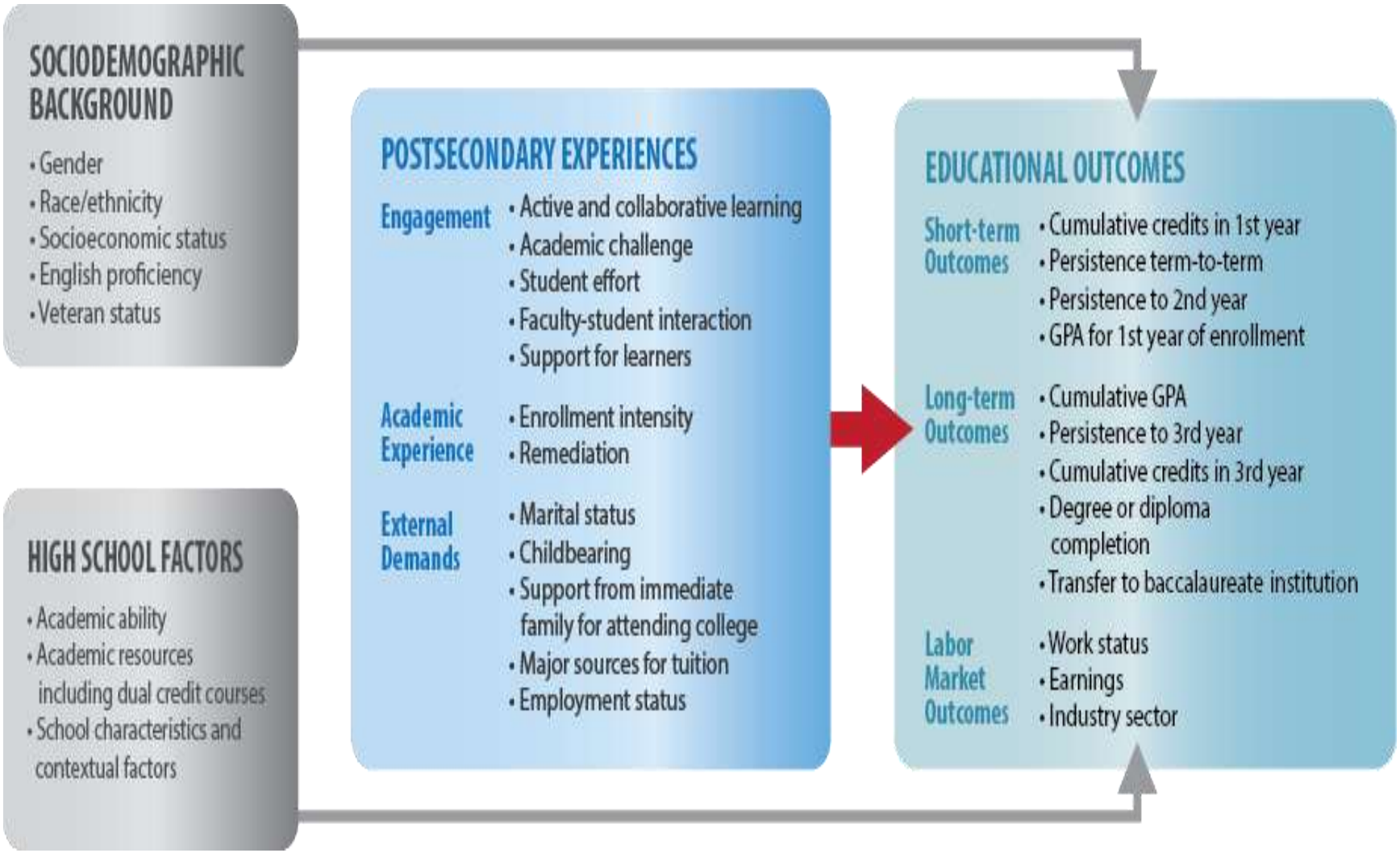
Wisconsin Technical College System

Two Guiding Questions:

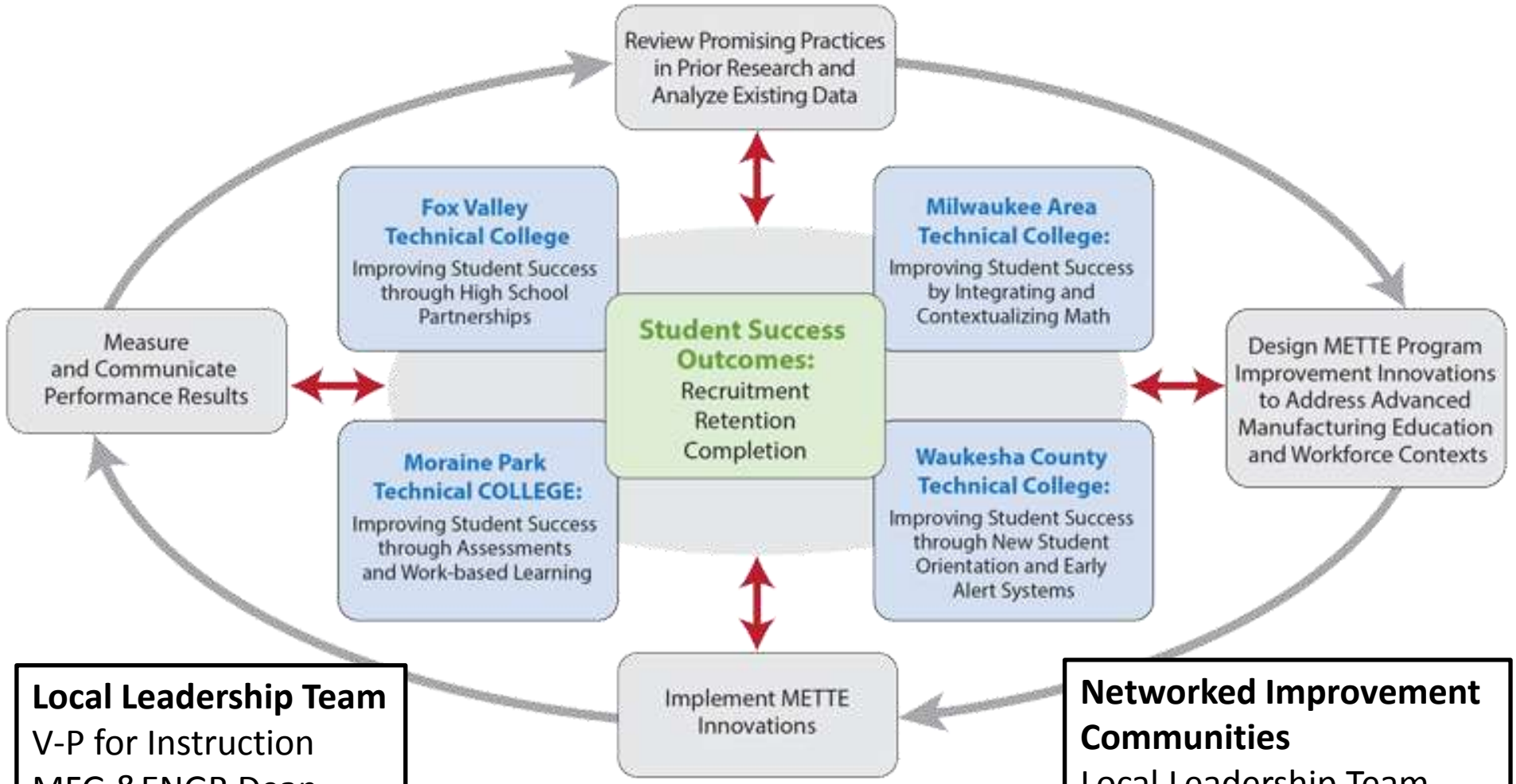
1. What are the specific METTE program features that are associated with optimal student outcomes?

2. How can key METTE stakeholders use research data and findings to inform strategic program improvement decisions?

METTE Student Success Model



Research and Innovation Framework



Local Leadership Team
V-P for Instruction
MFG &ENGR Dean
Institutional Research Office
UW Mad Researcher

Networked Improvement Communities
Local Leadership Team
Associate Deans
Faculty Leaders
Inst. Research Analysts

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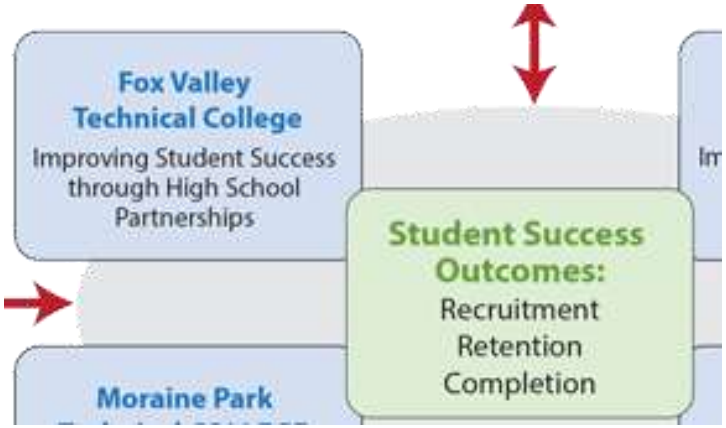

METTE at FVTC
Improving Student Success Through High School Partnerships

2013-16 Strategic Priority:
Increase by 10% each year the number of high school graduates who enter FVTC programs with prior FVTC credits (2012 Baseline: 13.4%)

Research Questions

1. In what ways do school-level and student-level characteristics influence students' early success at FVTC?
2. Do school-level measures have an effect above and beyond their corresponding student-level measures?

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PROJECT OUTCOMES

1. Provide each high school community with a report describing their graduates' success at FVTC and beyond.
2. Create a baseline for documenting and tracking the effects of various FVTC Early Career Success partnership projects:
   - Career Jump Start—Machine Tool (3 new dual credit courses in 5 high schools during 2013-14)
   - Dual Credit Summer Teaching Academy (2013--5 CTE inst.)
   - Completion of ACCPLACER by all students in Grade 11
   - New academy development -- manufacturing, technical or engineering
3. Benchmark the effectiveness of high school partnership linking practices

FVTC College Success Report for XXX High School

PROFILE: Fall Enrollment, 2009-11 Cohort	Other Large FVTC High Schools (n=16)	Career Jump Start (CJS) High Schools (n=5)	XXXX High School
Direct	2485/64%	695/69%	231/70%
Within 2 years	1398/36%	312/21%	100/30%
Male	46%	52%	49%
Female	54%	48%	51%
White	73%	76%	73%
Hispanic	12%	9%	10%
Asian/Pacific Islander	8%	6%	9%
African American	7%	5%	7%
English Language Learners	4%	2%	5%
Students with Disabilities	15%	15%	18%

CAREER PATHWAY INDICATORS: Fall Enrollment, 2009-11 Cohort	Other Large FVTC High Schools (n=16)	Career Jump Start (CJS) High Schools (n=5)	XXXX West High School
Engineering Programs	109	33	7
Manufacturing Programs	75	30	6
Other STEM Programs	90	42	10
Other Programs	150	89	25
Technical Diploma, 1 Year	245	86	40
Technical Diploma, 2 Year	330	113	21
Associate Degree	1504	374	132
Associate Degree, Transfer	55	18	1

LOCAL LEADERSHIP TEAM:

Patricia Frohrib, Director, College Effectiveness; Chris Matheny, VP – Instruction; Steve Straub, Dean of Engr & Mfg; Mary Hansen, Director, K-12 Partnerships; Allen Phelps, Researcher, UW-Madison

STUDENT SUCCESS INDICATORS: Fall Enrollment, 2009-11 Cohort	Other Large FVTC High Schools (n=16)	Career Jump Start (CJS) High Schools (n=5)	XXXX High School
Percent of successful course completion	74%	75%	81%
Percent retained from Fall to Spring term	68%	65%	70%
Percent graduating in 3 and 5 years	43%/51%	40%/45%	50%/55%
Percent of graduates employed within 6 months	89%	78%	92%

INNOVATION-LINKED STUDENT SUCCESS INDICATORS: Fall Enrollment, 2009-11 Cohort	Other Large FVTC High Schools (n=16)	Career Jump Start (CJS) High Schools (n=5)	XXXX High School
No./% of high school graduates entering with prior FVTC credits	11%	12%	18%
No./% Jump Start Summer Enrollment	2%	3%	6%
No. of basic skills students transitioning to program courses	75	18	9
% with admissible A/R/W ACCUPLACER scores	90%	85%	92%
% transferring in from 2-year	10%	8%	2%
% transferring in from 4-year	15%	7%	3%
% co-enrolled at 2-year college	15%	7%	1%
% co-enrolled at 4-year college	8%	8%	3%
% transferring to 2-year college	5%	2%	1%
% transferring to 4-year college	12%	7%	8%

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BENCHMARKED EVIDENCE, INNOVATIONS and INDICATORS: High School-Community College Partnership Practices

Longitudinal and Trend Evidence

Student Success Indicator/Outcome	*Practices/Policies/ Effects*	*Methods/ Comparisons*	*Population Served*	*Citation/Website*	*Implications for METTE/NIC*
Enrollment in 2YR college METTE program	HS enrollment in academic & technical track (p<.05) Do AP math (p<.05)	2002-2006 longitudinal study/two logistic regression models	National sample of 2002 sophomores	METT Brief #1 mette.wceruw.org	Build METTE programs of study with rich math and science. Support Common Core Standards implement.
Retained to 4th term or completed	Dual Enrollment HS Course/+5%; Initial summ enroll/+19%	Path Model	All WTCS students enrolled 2009-10	METTE Brief #2 mette.wceruw.org	Develop incentives for summer enrollment
Significantly higher rates of: college enrollment, persistence to 2nd term and yr. plus	FL Dual Enrollment Courses in HS/+17% enrollment in HE,+15 credits in 3 Yr./ +5% return for 2nd year	HS graduates with and without DE courses/controls for school & student characteristics	All FL high school graduates (299,685) in 2000-01 and 2001-02.	Community College Research Center (2012)	Benchmark ways of delivering DE courses.

Empirical and Case Study Evidence

Student Success Indicator/Outcome	Practices/Policies/ Effects	Methods/ Comparisons	Population Served	Website/Citation	Implications for METTE/NIC
Initial Community College Enrollment (+11%) and 2nd Year Retention (+11%)	Regional half-day academy featuring project based learning labs sponsored by industry partners	Propensity score matching with similar students attending same home high schools over 7 years	Diverse urban/ suburban community	Center for Advanced Research and Technology/ http://www.cart.org/	High schools should incorporate project-based learning experiences and labs for each career pathway.

NETWORKED IMPROVEMENT COMMUNITY CHARTER

Research Questions:

1. In what ways do school-level and student-level characteristics influence students' early success at FVTC?
2. Do school-level measures have an effect above and beyond their corresponding student-level measures?

FVTC-High School Linking Innovations:

Career Jump Start—Machine Tool Operations coursework (3 new dual credit courses in 5 high schools during 2013-14)
Dual Credit Summer Teaching Academy (2013--5 CTE instructors)
High School Academies and Programs of Study: Manufacturing, Technical or Engineering-focused
Completion of ACCPLACER by all students in Grade 11

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Some Early Findings

Aspirations and Enrollment in STEM Fields

From a national sample of 2002 high school graduates, we found:

- Students who described themselves as being in both the academic & occupational tracks in high school were more likely to enroll in manufacturing programs instead of other STEM fields.
- Having at least one advanced placement (AP) math credit in high school was associated with 70.3% (girls) or 25.8% (boys) more likely to aspire to manufacturing fields, and 44.2% (girls) and 7.6% (boys) more likely to actually enroll in manufacturing fields at two-year colleges.

Source: Students in Manufacturing and Other STEM Fields at Two-Year Colleges: An Exploration of Aspirations and Enrollment (Spring 2012)

Some Early Findings

For recent high school grads who attended one of the technical colleges in Wisconsin in 09-10 academic year, we found that:

- Summer enrollment in 2009 is the strongest predictor of future educational success: Students who took summer courses were 19% more likely to be retained at the 4th term or to graduate earlier than their counterparts.
- Students who experienced delayed entry to college were 6% less likely to be retained or graduate at the 4th term.

Source: The Influence of Dual Enrollment and Early Academic Momentum on Two-Year Technical College Student Success (AERA, April, 2013)

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Discussion Questions:

How can longitudinal data be used to evaluate ATE projects, program improvements, program innovations, and to track student progress?

In what ways can qualitative research methods (e.g., interviews and focus groups with students, instructors, and industry partners) clarify the importance of engineering technology (ET) programs, understand the factors affecting ET students' decisions, and enhance our understanding of the challenges and transitions encountered in different settings by increasingly diverse students?

When integrated, how can mixed methods of targeted research improve student outcomes and success in ATE pathways?

WEB-BASED RESOURCES FOR ATE PROJECTS

PathTECH http://sociology.usf.edu/pathtech/team/

METTE http://mette.wceruw.org/

Evidence-Based Innovations

- CCSSE http://www.ccsse.org/center/
- Policydirect.org http://www.policydirect.org/
- OCCRL http://occrl.illinois.edu/
- NRCCTE http://www.nrccte.org/
- Teaching Technicians – Proven and Promising Practices

  https://www.teachingtechnicians.org/Resources/PPP/
- CCRC http://ccrc.tc.columbia.edu/
- CAPSEE http://capseecenter.org/