

# Programs of Study: Findings From Three National Research Studies

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# Outline

- Alfeld & Bhattacharya – Mature POS
- Hammond et al. – SC's Personal Pathways
- Castellano et al. – Rigorous Tests
- Discuss elements of POS
- Their presence/absence in these studies
- Which elements seem to matter most
- Data Interludes

# Goals of NRCCTE POS Studies

- Alfeld & Bhattacharya
  - “Backwards mapping” starting at CC
  - Identifying the factors that led to their success
- Hammond et al.
  - Exploring how a statewide C&CR reform helps implement POS
- Castellano et al.
  - POS student achievement compared to similar students not in POS

# Perkins IV and Other POS Guidance

- The Four Elements of the Law
  - Secondary-Postsecondary Elements
  - Non-Duplicative Course Sequences
  - Opportunities for Dual Enrollment
  - Industry-Recognized Credential or Degree
- The Ten Components of the Policy Guidance

# Data Interlude #1

- We thanked our district data contact for answering yet another question about the data: “Not a problem. It’s nice to know I can commiserate with someone who recognizes how bad [district] data collecting is.”

# Alfeld & Bhattacharya Study

- Studied “mature” POS that had an active pipeline between HS and CC
- Sample size = 213 HS juniors/seniors
- 30% continued in the POS in CC
- Students who earned more POS credits also:
  - Earned  $\sim 1/5$  credit more in math and science
  - Earned higher grades in math and science
  - Scored higher on English standardized tests (no effect on math tests)

# Alfeld & Bhattacharya- HS Results

- Using data from student surveys and their HS transcripts, they found that students who earned more POS credits also:
  - Earned more college credits while in HS
  - Had a higher CTE GPA
  - Believed that what they learned in school would be useful later in life
  - Believed that being in a POS made it less likely they would drop out

# Alfeld & Bhattacharya- Transition

- They followed this cohort to CC and found 65% of them (n = 138).
  - 23% attending a 4-year college
  - 41% attending CC
  - 4% attending technical college
  - 2% entered armed forces
  - 29% working (and no school)
  - 1% unemployed (n = 2)
  - 38% of those attending school were also working



# Alfeld & Bhattacharya- Survey

- “How Could High School Have Better Prepared You for College or Work?”
  - Have more demanding teachers who hold them accountable
  - More one-on-one, encouraging teaching
  - More rigor (*relevant* math & sci, dual credit)
  - More real-world experiences and examples

# Alfeld & Bhattacharya- CC Results

- They were able to collect college transcripts for 87 of the 138 students (= 63%).
  - 55% had earned at least 12 college credits by the end of their first year (does not include dual credits earned prior to college enrollment)
  - 15% earned an occupational certificate
  - 8% earned associates degree
  - 10% transferred to a 4-year college

# Alfeld & Bhattacharya- More CC

- They compared their sample in CC to others in the same POS from other HS
  - May or may not have had POS experience
- The POS sample earned:
  - A significantly higher GPA and were taking significantly fewer remedial courses
  - More dual credits, college credits, and certificates

# Alfeld & Bhattacharya- POS Components

- Of the 10 components of the policy guidance, 4 were considered critical to POS development:
  - Partnerships
  - Course Sequences
  - Legislation and Policies (including budgets)
  - Credit Transfer Agreements

# Alfeld & Bhattacharya- Conclusions

- Beginning a POS in HS and continuing in college provides an advantage to students
- POS help CTE students by providing a road map to college, offering a sequence of courses that leads to a postsecondary degree or credential
  - The opportunity to participate in dual enrollment provides critical momentum

## Data Interlude #2

- We had many questions about the data, sometimes it was, is this just a case of human error?
- He once replied, “This is probably multiple humans erring.”

# Hammond et al. Study

- South Carolina passed EEDA in 2005
- Initiated Personal Pathways to Success
  - K-16, career awareness and exploration at all school levels
  - Organized HS curriculum around career clusters
  - Enhanced role for school counselors
  - Study focused on the HS career pathways, some of which were POS

# Hammond et al. Design

- Tracked 2 student cohorts
  - Class of 2009 (little exposure to reform)
  - Class of 2011 (all 4 years of HS exposure)
- Examined impact of level of community/  
economic resources on implementation
  - 8 HS from economically diverse regions



# Hammond et al. Counselor Role

- EEDA changed counselor duties
  - No more administering standardized tests
  - No more creating the master class schedule
  - Increased career guidance
  - Increased academic advising
  - Increased coordination of activities (guest speakers)
  - Major role in helping to implement the policy

# Hammond et al. Findings

- Lower-income communities embraced the reform more than more affluent ones
  - Lower-income areas saw it as an avenue to prosperity
  - Affluent areas didn't expand their CTE
- Students were benefiting but the type and degree of benefit varied

# Hammond et al. Findings

- Career-focused activities at all sample schools increased
- The extra funding and staff (i.e., counselors) helped implementation
- Schools still struggled to meet all mandates during a recession
- Business partnerships were key to successful implementation
  - Guest speakers, WBL, internship opportunities

# Hammond et al. Findings

- Students claimed to benefit from IGP process:
  - Getting started with career planning
  - Thinking about and develop future career goals
  - Connecting their coursework to those goals
- The IGP process made more students aware of CTE
  - Increased participation in CTE
  - Decreased stigma of CTE in some HS

# Hammond et al. POS Components

- Of the 10 components of the policy guidance, 3 were described in their work as critical to POS development:
  - Legislation and Policies (EEDA, IGPs)
  - Partnerships
  - Guidance Counseling and Academic Advisement

# Varying Perspectives

- Alfeld & Bhattacharya study: situated in transition between HS and CC
  - Course sequences and Credit transfer agreements at forefront
- Hammond et al. study: situated in HS
  - Guidance counseling at forefront
- Castellano et al. study: tracked students from HS to CC
  - More to say about all elements

## Data Interlude #3

- We asked how certain courses were included in the GPA count because it didn't seem to make sense.
- “You are venturing into uncharted waters with respect to what we deal with here. I don't think I've ever gotten down to the business of calculating a GPA here.”

# Castellano et al. Study

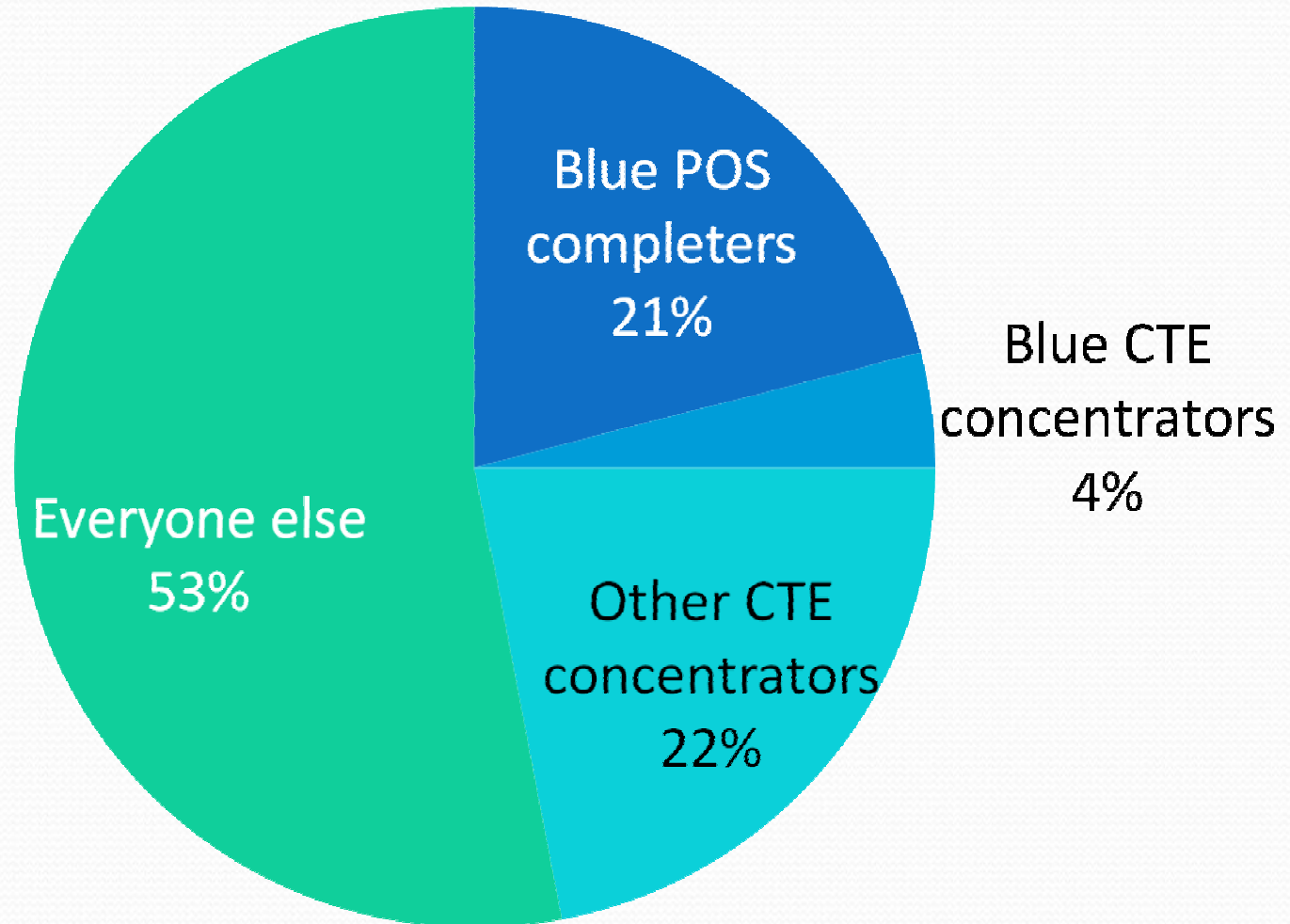
- Selected 3 districts that had POS that students entered via a lottery system
- Goal was randomized controlled trial
  - Researchers consider “true experiments” to be the best way to determine if an intervention improves outcomes
  - Very difficult to set up—we now know the “dirty little secrets” of district lotteries



# Castellano et al. – East District

- One tech-focused wall-to-wall academy HS
- 3 academies:
  - Pre-Engineering
  - Biotechnology
  - Information Technology
  - Several POS within each academy
- Outcomes compared to matched comparison students

# East District Sample



# Castellano et al. – East District Test Score Results

- POS completers earned higher scores than:
  - everyone else on the algebra test
  - nonBlue CTE concentrators on the English and science tests
- No other differences between any groups' scores
  - POS completers = Blue CTE concentrators

# Castellano et al. – East District Credits Results

- We compared the credits earned by POS completers to each of the groups in turn.  
Significant differences:
  - POS completers earned more AP credits than all other groups
  - POS completers earned more CTE credits than all other groups

# Castellano et al. – East District GPA and Grad Results

	POS completers	Everyone else	nonBlue CTE concentrators	Blue CTE concentrators
Overall GPA	2.77	2.67	2.51	2.64
Academic GPA	2.61	2.50	2.33	2.42
CTE GPA	2.78	2.75	2.73	2.65
Grad rate	97.3%	93.1%	96.1%	90.0%

# Castellano et al. – Other East District Results

- No difference between POS completers and either group on:
  - Number of math credits earned
  - Number of higher math credits earned
  - Number of science credits earned
  - Number of dual credits earned
- POS can be delivered without harm to HS achievement

# Castellano et al. – East District – A School Effect?

- Given the results, we decided to compare the Blue POS completers to the Blue CTE concentrators
- The *only* difference was in CTE credits earned, which is a definitional difference
  - No difference in AP or STEM credits earned
  - No difference in graduation rates
  - No difference in test scores

## Data Interlude #4

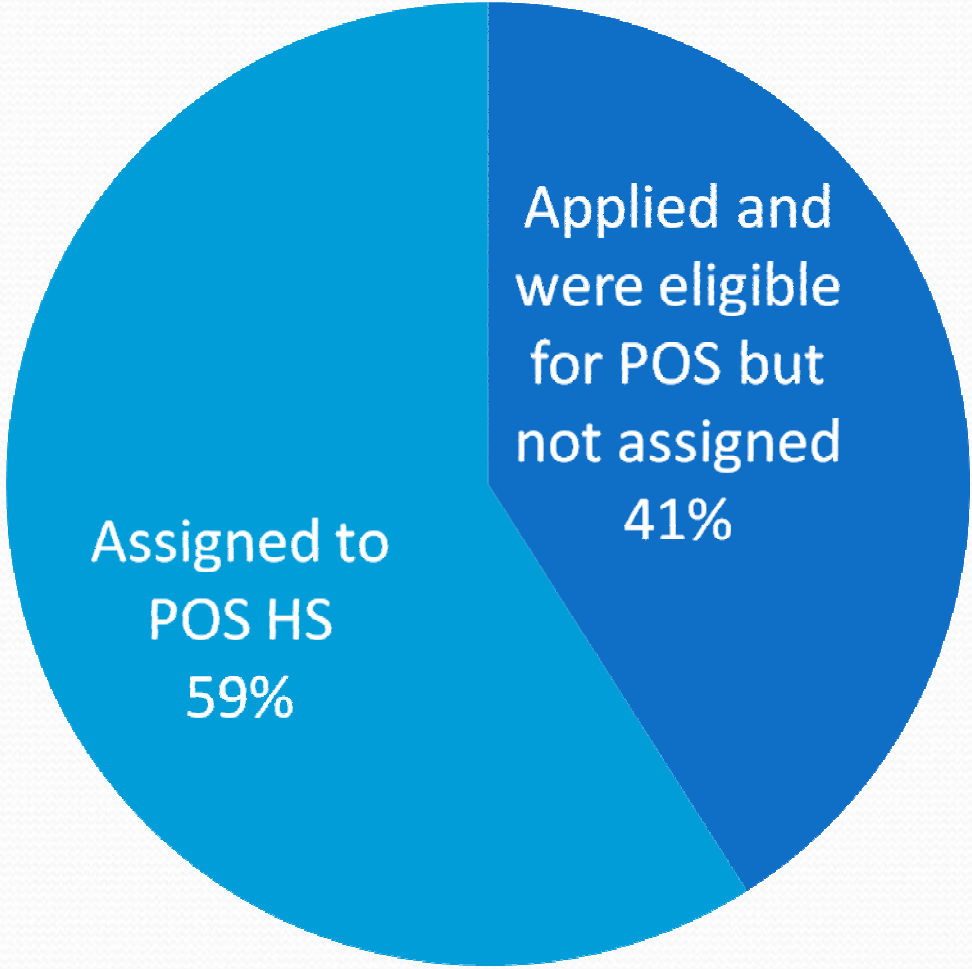
- In an email from our data contact: “I see they’ve added a 5<sup>th</sup> digit for CC courses, without notifying us. I’ve updated my code and will send an updated file.” We thanked him, which prompted: “No biggie...besides I end up learning about our own data anyway (you’d be horrified at the lack of documentation ...because there is none!)”



# Castellano et al. – West District

- Navy HS: new facility with POS housed in modular units (including academic teachers)
- Sky HS: former career center with upgraded academic focus
- Azure HS: wall-to-wall high tech academies
- Outcomes compared to students who applied to be in the POS but were not selected

# West District Sample





## Castellano et al. – West District Research Question

- What is the effect of assignment to POS HS and number of CTE credits earned on GPA and graduation?
  - Not yet able to address the issue of CTE concentrators and a “school effect” over POS effect in West

# Castellano et al. – West Results

- Controlling for student background characteristics, being assigned to one of the 3 wall-to-wall POS HS in West District and earning CTE credits:
  - increased the probability of graduation by ~7%.
  - had a positive but nonsignificant effect on overall GPA

# Most Important Points

- So far, POS students perform at least as well and in some cases better than their matched counterparts
- We are seeking funding to continue this study into postsecondary
  - The Kemple/MDRC Career Academy study didn't see the breakout results they did until 8 years after HS graduation
  - POS is not just about getting better grades—we have to see what they study in college, what kind of career they pursue to really tell the tale of POS

# Break!

- Stand up and stretch
- Have a drink of water
- Exhale

# Perkins IV and Policy Guidance

- **The Four Elements of the Law**

- Secondary-Postsecondary Elements
- Non-Duplicative Course Sequences
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- We'll present anecdotes of best practice from the Castellano study

# The Four Elements of POS

The elements are:

- Vague
- Inconsistent
- Repetitive



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# Secondary-Postsecondary Elements

- Advisory boards
  - “We have people from the CCs and technical schools that sit on our advisory board. So our kids that come through our programs ... can go into one of the local programs and go in at a higher level... because it’s vertically aligned.”
- Sharing facilities, teachers, textbooks
  - Sometimes the HS is newer and has a better facility
  - Some CCs can provide the PD to get HS teachers certified to teach college (dual enrollment) courses

# How Do Students Benefit?

- Students get permission for early dismissal, take the bus (passes provided) to the CC or take a night class there:
  - “[For] some of them that work, that was great for them because they could earn a little money, they earned college credit, and they’re still in the high school – can you imagine the independence that they felt and the parents are looking at the responsibilities that they have, and the maturity level, you know, they can drive. It was great. Kids loved it.” (IT teacher)

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# Non-Duplicative Course Sequences

- Things change!
  - Very few of the POS we tracked for 4 years remained the same
  - School-level differences in the same district
- Takes constant work
  - Industry updates requirements, CC and HS must follow
  - Hence the important role of advisory boards

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# Opportunities for Dual Enrollment

- Issues around obtaining credit even in the best of cases
  - If student doesn't attend that college, the credits are often forfeited even if they were awarded
- In the worst cases, students must take challenge exams to get the credit
  - Sometimes credit is based on the HS attended (i.e., inconsistent within district)

# Opportunities for Dual Enrollment

- Note that student-level data from district only shows credits earned in HS, not college
  - Many of those credits are never obtained
- Students in our study wanted to attend 4-year colleges, so they weren't interested in CC credits.
  - They preferred AP to dual enrollment



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# Industry-Recognized Credentials

- Female health occupations POS student:
  - “The medical program has definitely put me a thousand steps ahead of everybody. They may have graduated high school but I can say I graduated high school with my CNA, my EKG and I worked towards my personal trainer [certificate]. Even if I haven’t gotten it I still have the background behind it.”

# Perkins IV and Policy Guidance

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# 1. Legislation and Policies

- These 3 states provided approved CTE and academic courses from which districts and schools built their own POS
- State law could conflict with the goals of POS
  - E.g., class size reduction laws for academic classes
- State and local sales taxes and bonds were passed to build and equip POS high schools

# 1. Legislation & Policy: Funding

- A constant battle for quality equipment:
  - “I had to fight every step of the way, in justification of every piece of that equipment. Because I kept getting ‘But you can use *this*.’ Well that’s what wedding photographers use out of the bottom of somebody’s car. It was not durable enough to last for these kids to use every day for a school year, when you’ve got almost 300 kids using it. There’s no way. I mean you want to produce something good. You’re training these kids for careers for their life here. You know, this is not just a little elective where they go in and play. This is something these kids want to leave and go do for a living. You’re training a workforce here.”  
(Media teacher)

## 2. Partnerships

- Business partnerships - advisory boards
  - Provided WBL opportunities, curriculum guidance
- Postsecondary partnerships
  - Built articulation agreements, curriculum guidance
- Community partnerships
  - Provided opportunities for WBL sites, community service requirements

## 3. Professional Development

- “Most of our professional development these days seems to be related to the state test. So all of us in every school and I don’t care what your job is. If you are a cafeteria manager. If you are a secretary. If you are a high school guidance counselor, a career choice coordinator, we are all involved in professional development related to the test.”

## 4. Accountability and Evaluation

- Different models in our 3 districts:
  - West had 10<sup>th</sup> grade high stakes tests
  - East had end-of-term assessments
  - South had high stakes but was moving to end-of-term assessments
- East and South went to online testing
- All used interim assessments for core courses
  - rapid turnaround of results and targeting teaching



## 5. College and Career Readiness

- One principal described freshmen every year as running around the halls like “little water bugs.” But over 4 years they mature and he is always impressed at the intellectual and soft skills development and how they present themselves in public.
- WBL and dual credit opportunities, career guidance, industry credentials, high expectations



## 6. Course Sequences

## 7. Credit Transfer Agreements

- 6. Same as Non-Duplicative Course Sequences above
- 7. Same as Opportunities for Dual Enrollment above

## 8. Guidance Counseling

- No redefinition of counselor duties like in SC
- Most counselors we spoke to reported:
  - carrying heavy student caseloads—well over the ideal 250 to 1 ratio
  - having their most regular contacts with students at course registration periods
- CTE or POS teachers do most career counseling

## 9. Teaching and Learning Strategies

- South District: Teacher common planning time and curriculum integration existed
  - But threatened by other laws, budget
- West and East: The schedules, recession, and district culture prevented either from happening

# 9. T&L Strategies:

## Curriculum Integration

- “This state never did buy into it wholly, as in, ‘let’s sit down at the table with the academic teachers to integrate.’ What we do is, if it’s a drafting teacher and maybe students need geometry skills, the drafting teacher teaches those skills, but it’s not aligned in any way with what that geometry teacher would be doing at that time.” (CTE Chair)
- “I feel that everybody is so stressed about teaching what they’re going to be tested on in their own curriculum, it’s really hard for them to move beyond that.” (Theater teacher)

## 9. T&L Strategies: Soft Skills

- Teamwork, problem-solving, communication skills, familiarity with technology
- CTSOs
  - All three districts had national CTSO champions and dynamic teachers
  - CTSOs provide soft skills curricula
- Community service requirements
- WBL

# 10. Technical Skills Assessments

- West District's state had not yet developed technical skills assessments
- East District's state had a long history of providing mandated technical skills assessments
- South District's state adopted industry-recognized credentials as its assessment system

# All Three Studies: Which Components Are Most Important?

- Alfeld & Bhattacharya: Legislation and Policies, Partnerships, Course Sequences, Credit Transfer Agreements
- Hammond et al.: Legislation and Policies, Guidance Counseling, Partnerships
- Castellano et al.: The same, but we added Teaching and Learning Strategies (which leads to PD)



# Student Perspectives

- Female health occupations POS student who is glad she got away from her middle school:
  - “This [POS] school could really change someone. It gets you to the career path that you want and if you’re around people that want to do it and succeed you’ll want to succeed too.”

# Student Perspectives

- Female legal POS student:
  - I: Is there anything else that we didn't talk about that you think is important?
  - B: Not really except for maybe how well they actually really do prepare you here for college. I feel really prepared because of the workload and the different ways that we are learning why we're doing something. Not just learning the actual topic...[but] the reasons behind it.

# Student Perspectives

- Male health occupations POS student:
  - “Our medical teachers are always asking what colleges did I apply to, you know, am I getting my stuff done like scholarships and things like that. Usually regular teachers, they won’t really get on you – like ‘What are you doing to go to college?’ I think that’s one of the reasons it’s good to be in a career academy.”

# Student Sophistication About Goals

- Female business POS student at West District:
  - M: I actually want to go into the medical field. I either want to go into pediatrics or neurology. Depending on how much schooling I want to go through.
  - I: How do you see your business program fitting in?
  - M: Because business is necessary for everything that you do. I mean you need to have basic business skills. Especially if I decide to open my own practice versus working for a hospital, then I'm going to need to be able to run a business. Because medical provides you with a service, but it's still a business when you get right down to it.

# Data Interlude #5

- Data-driven decision-making is only as good as the data we have
- How can we make decisions about POS when we don't have the data?
- “We're dealing with an imperfect system.”
  - Response to why it appeared that some courses were being counted twice for credit

# What Makes It Work: The Teachers

- “The teacher makes all the difference. Understanding that project- or problem-learning is the key to success. The equipment, all of our high tech stuff – it’s beneficial – it puts students at the level that they’re really ready for college. But they’re not necessary. It’s the teacher and the creativity process that’s the difference.” (District administrator)

# What Makes It Work – Teachers+

- “There’s 3 key things:
  - “The number one priority to me: We have awesome **teachers.**”
  - **Advisory board:** people from the community, from business, that help us with our internships. [Each] meets once a month, here on campus, and we’ll have 40-45 people, people from the community colleges, technical schools.
  - **Facility:** the culinary lab, the TV studio: “we have people from industry come here and look at our TV studio and say, ‘At Channel 5 we don’t have this.’”



# The Intangibles: Making a Connection

- “I know that it makes a difference when kids who don’t connect anywhere else, whether it’s athletics, or band or drama, they connect with our career academies, and any time you have that kid you’re afraid you’re losing – they get involved in one of these programs and it seems to make the difference in them being successful in school.” (South principal)



# The Intangibles: Making a Connection

- “You have to find something these kids enjoy coming to school for. You know, they’re not coming here to enjoy calculus, and they’re not coming here to enjoy chemistry. But if you can tie it to medicine, which is something they have a desire for, they’re going to excel and that’s the important part of having these type of programs.” (South principal)

# NRCCTE POS Research

- Alfeld & Bhattacharya is on the NRCCTE website
- Hammond et al. is under review then it will be posted on the NRCCTE website
- Castellano et al. should be complete next spring
  - Resolve data issues
  - Run all analyses on all districts

# For More Information

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