



Open Learning

Workforce Education Project - Report

Sanjay Sarma

Bill Bonvillian

Jenna Myers

Meghan Perdue

MIT Open Learning – Project Team

Presentation - National Academies of Sciences
Innovation Policy Forum and GUIRR Webinar
June 8, 2020

[SS] Lesson from Coronavirus:

- Pandemic makes very stark the consequences of our growing economic inequality
- The poor and working class have paid a disproportionate price in sickness, loss of life, and economic loss
- Unemployment is now 20 million
- Many sectors face major damage – retail, restaurants and hospitality, transportation – many will have to shift job sectors
- One critical tool we will need: workforce education
- Can raise skills, increase job opportunity, enable better-paying, quality jobs
- Workforce education now much higher on the policy priority list
- But how do we improve workforce education?

[SS] Report Issue: What to do about the “quality job” problem?

This study is from MIT Open Learning – it found it was increasingly offering workforce learning in its online programs.

In 2018, we started research on: What was the workforce ed challenge?

Schmidt Futures foundation supported study.

- Aim:
 - 1) Phase 1: study of overall workforce education system, strengths and weaknesses – that’s this report
 - 2) Phase 2: identify pilot workforce projects that MIT could participate in with potential partners – that is ongoing
- This is the Preliminary Report; final report in book form at end of year

The Workforce Education Project Table

The Table Top:

- Secondary Ed
- Tertiary Ed &
- Workforce Ed



The Table Setting and Silverware – the new tools:

- New technology
- New delivery methods
- New credential tracking (for capability measures)

The Table Legs: Key Sectors - Manufacturing, Retail, Health
- *have to understand workforce in sector context*

[WB] The Workforce Education Challenge

- Disconnect between work and learning
- Disinvestment by government and employers
- Labor Dept. training programs don't reach higher technical skills, incumbent workers
- Education Dept. programs focused on college not workforce needs and not linked to the Labor Dept. programs
- Vocational education in secondary schools largely dismantled
- Underfunded community colleges, lack the resources to provide advanced training in new fields and have too low completion rates
- Colleges and universities disconnected from workforce education
- Lifelong learning is missing
- Underfunded advanced technical education programs at NSF and at Advanced Manufacturing Institutes
- A broken a broken labor market information system
- The existing actors are in "legacy" sectors - hard to change

Manufacturing

- Has been **middle class pathway** for men w/o college
- But **Median income is down for men** w/o HS diploma or w/HS diploma or some college
- U.S. **manufacturing employment fell** by one third, 2000 – 2010
- High overall **labor non-participation rate**
- **Coronavirus** hit some key sectors, for ex., aircraft production
 - But need more resilient supply chains – some reshoring? Flexible mfg. means new mfg. technologies so new skills for the workforce
- 2+m mfg. jobs will open up from **aging demographics**
- **Advanced manufacturing** will require higher skills

Retail: An ongoing social disruption

- **2005:** US overbuilt with 6x more retail sq.ft. as any European nation; 50% more per capita than Canada
- **2008:** Economic crash led to “discount model” of dumbing down the workforce, emptying stores of staff
- **2015:** Warehousing and robotics provide further disruption
- **2020:** Coronavirus forced massive closings, online take-off
- **New Model?** Sales clerk as personal advisor
 - “Omni-channeling” – online/face-to-face entry
 - Higher skills, IT fluent, guide customer through product options
 - How to train? Train the first level managers

Healthcare Delivery

Healthcare: Growing Sector

- An **aging** population, higher health care demands
- New medical **technologies** creating new professions
- Results: More jobs with **higher skills needs**, so **new training systems**
- **Barriers:** Established health professions, limited entry
- Could online entry help?

Upskilling is Ongoing:

- Jobs increasingly tend to go to **college educated**
- Some college – has replaced H.S. as core job credential
 - But college: **default credential?**
- But **growing IT**, demanding new skills
- **Result:** New high or middle skills jobs will require education beyond high school
- **Barrier:** only 1/3 of Americans over 25 have a 4-year college degree
- **Need:** new workforce ed system

Workforce Education System – Where do we need attention?

- Weak labor market information system:
 - Workers don't know what skills they need
 - Educators don't know what skills to educate for
 - Employers don't know what skills workers have
- Transition from school to work a problem in the US
 - Contrast: Germany, Austria, Switzerland
 - H.S. diplomas not enough and vocational H.S. largely ended,
 - CC's underfunded, completion too low
- Colleges are not engaged in workforce preparation
- No transferable skills certification system in most fields
- Ed and Labor Dept programs are not aligned
 - Labor Dept. : Programs focused on unemployed and underemployed, not upskilling,
 - Incumbents, new entrants not reached
 - Education Dept. : Pell grant programs focused on degree-only programs

New Education Technologies: Online Technologies

- Coronavirus forced education online
- Becoming widespread and can be optimized with blended learning
- Online is a way to scale-up to meet the changes from coronavirus
- Can join online with:
 - VR/AR technologies: Learning by doing
 - Computer gaming and simulation
 - Blockchain certification: Owning credentials
 - Bootcamps
 - Digital Tutors: Need AI advancement to combine shared education platforms (MOOCs) and individualize instruction and assessment
- *(MIT Open Learning is experimenting with each)*

[SS] EdTech enables a new pedagogy -

- *those fluent with MOOCs were prepared for CV19, most weren't*
- *if online is to scale, the learning lessons need to be absorbed*

- ***Bite-sized chunks*** – 10 Minute Segments
and the mind-wandering problem

- Enabler: Online

- ***Mind and Hand*** – hands-on learning –
examples:

- Generative Learning
- Tactile and Active Learning
- Blended Learning
- Enabler: VR/AR, prototyping
technologies

- **New Delivery Modalities**

- Online and Solving the Access Problem
- Enablers: Online Platforms with broadband access, MOOC's, certificates, Open EdX

- **Content** – *Formal, Informal, Professional* –
online can be geared to each

- **Pedagogy** opportunities and particular
EdTech opportunities:

- AI and digital tutors – personalized education
- Digital certificates and badging (blockchain)

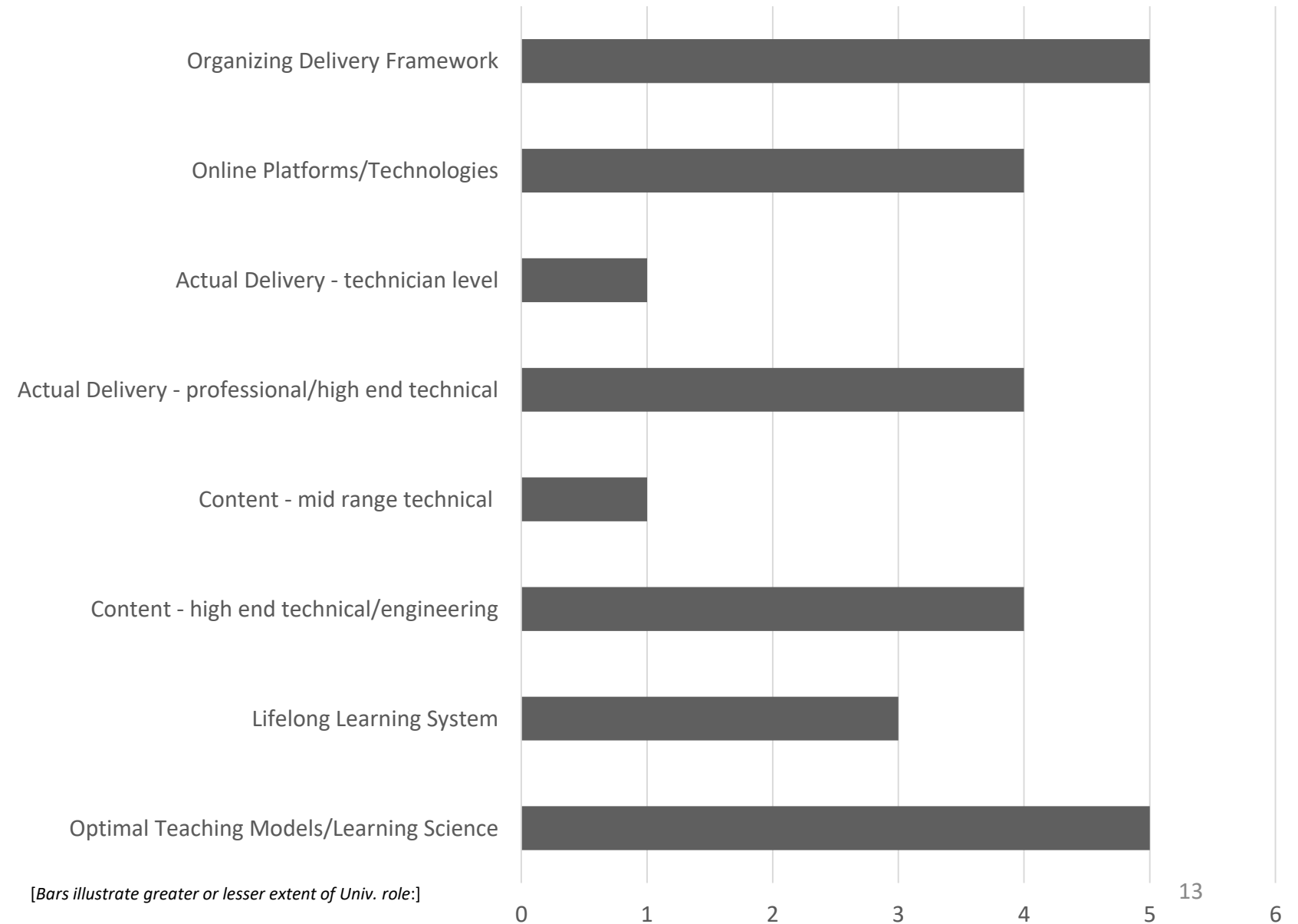
[SS]

Question:
What can a
University
do?

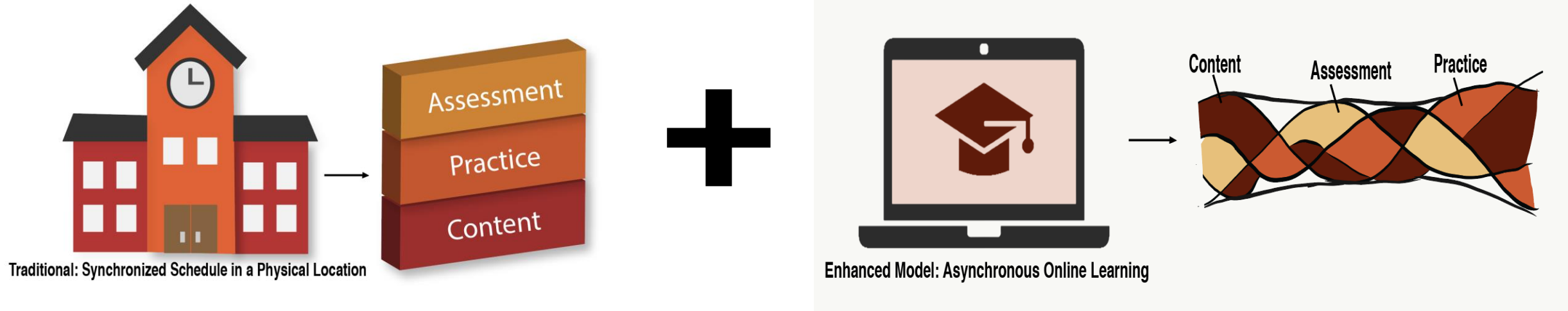
What is the University Role?

Roles in Different Areas:

("notional" chart)



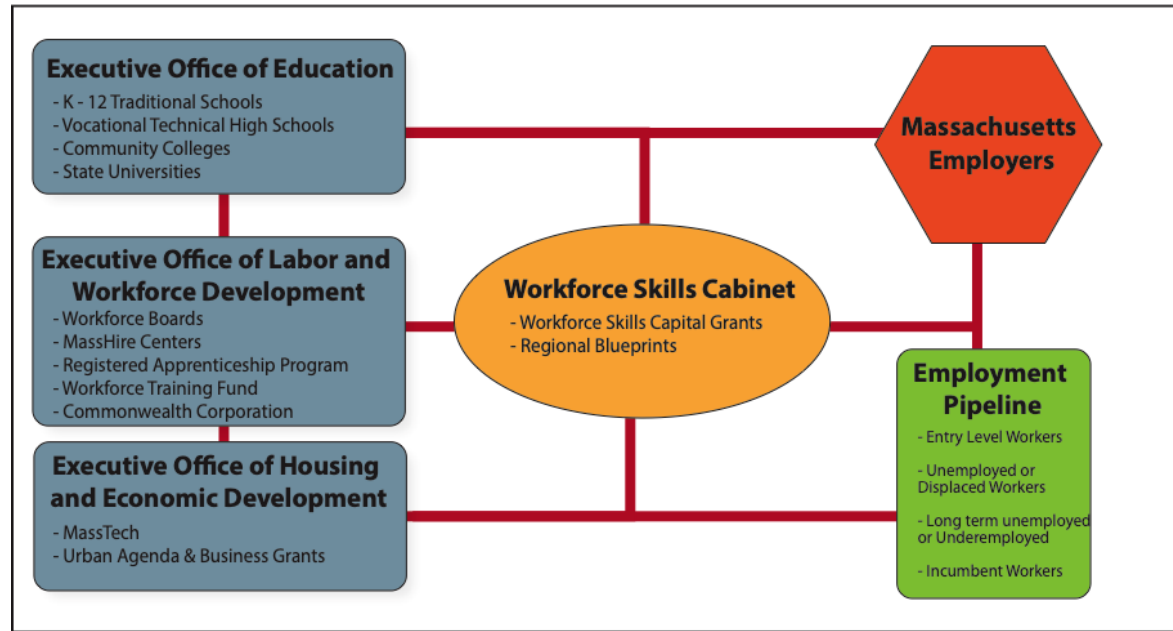
Institutional Rethinking of Time & Space Use



Policy Implications

- **New education technologies** - need development and implementation – VR/AR, gaming, digital tutors/AI – DOD role
- **Short Courses** - BUT must connect to CC certificates, degrees (NSF ATE dev. models, DOL workforce bds.)
- **“Trifecta”** - CC programs for CC students, plus incumbents, HS students (NSF ATE, Dept. of Ed, states)
- **Apprenticeships or “Apprenticeship Light”** - youth and CC – in fields that have clear lines for increased responsibility and wages, er-ee agreements (DOL)
 - Need for actors to coordinate: CC’s, employers and regional associations, state gov’t
- **CC completion rate**
- **Technical and Comprehensive HS’s** – state role
- **Expanded employer role** – appren./training, standards
- **New curriculum for advanced fields** – start with adv’d mfg. – Adv’d Mfg. Institutes/DOD Mantech/DOE/states
- **Unifying efforts at the state level** – states – across Labor/Ed
- **Labor market Information system** – DOL

Case Study: Massachusetts Workforce Development System

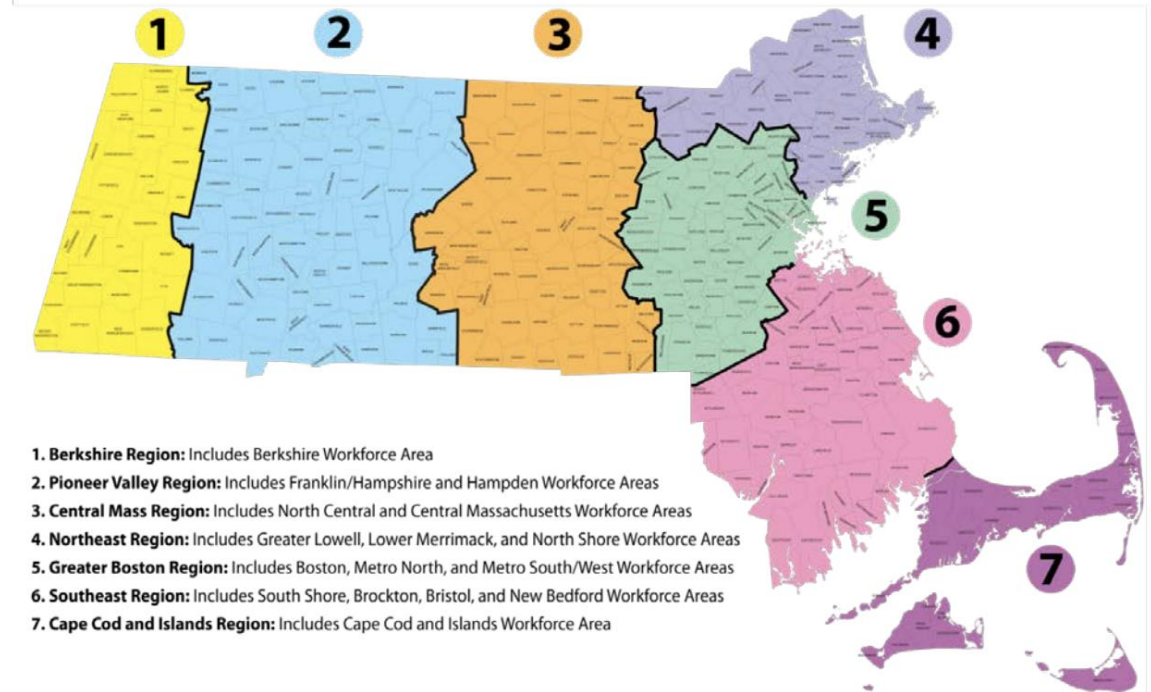


Issue: federal Labor and Education programs disconnected **New:** integrate at the state level – Joint planning and integration by agencies and institutions in Mass. at state and regional level

Entry Level

Middle – High School Career & Technical Training
Strong network of Vocational High Schools
Community colleges – Traditional & CTE
State Universities
Apprenticeship Programs

Figure 1. Map of Workforce Planning Regions



Unemployed / Underemployed

Training Opportunity Programs & Bootcamps
Community colleges
MassHire Employment Services & Support

Incumbent

Workforce Training Funds

Case Study: Employer engagement in college and career pathways in middle Tennessee

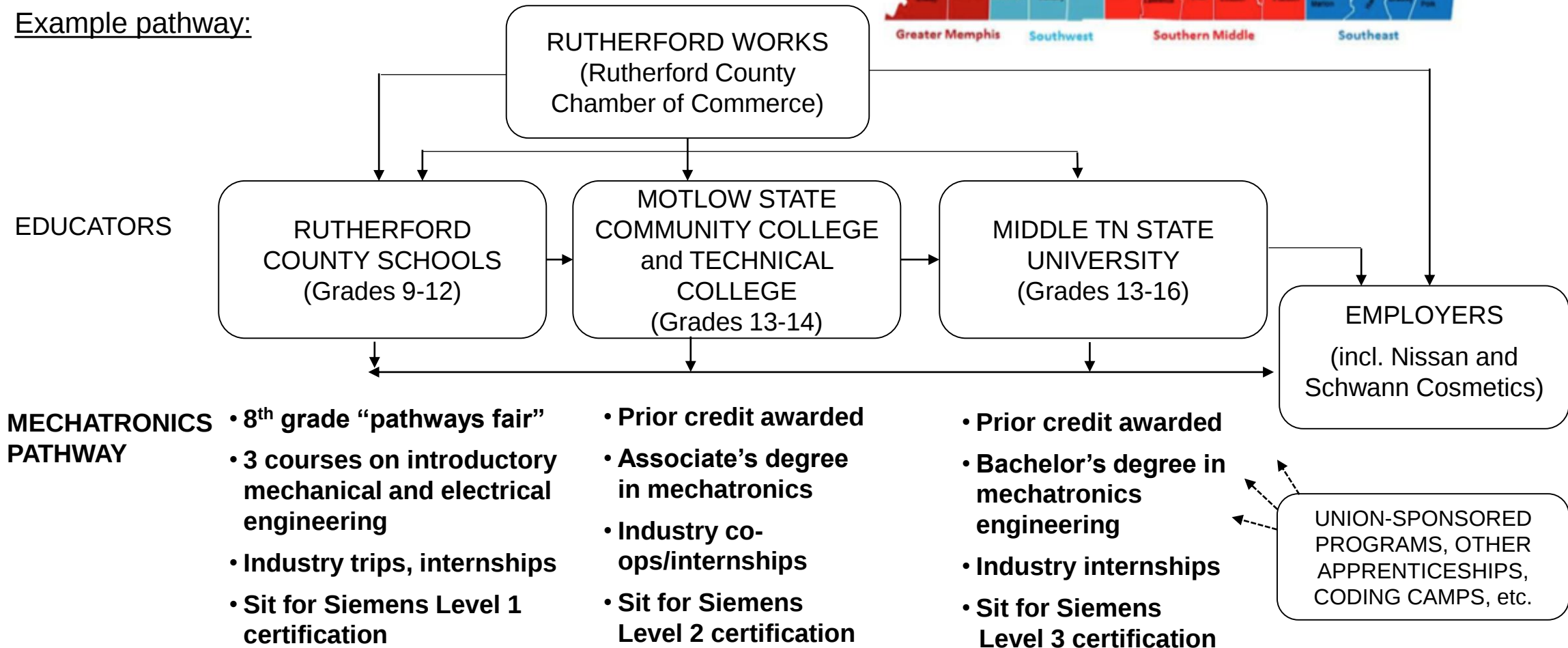
– “apprenticeship light”



Case Study: Employer engagement in college and career pathways in middle Tennessee – “apprenticeship light”



Example pathway:



	Traditional academic model (college prep)	Traditional vocational model (apprenticeship)	Regional college and career pathways model
Content	<i>Standardized</i>	<i>Customized</i>	<i>Modular</i>
	<u>Description:</u> core academic courses supplemented by electives and extracurriculars	<u>Description:</u> - occupation-based technical content, on-the-job learning - supplemented by classroom content	<u>Description:</u> technical/academic content offered through both classroom courses and work-based learning includes core academic content
	<u>Drawbacks:</u> - limited career advising/exploration - limited opportunities to develop occupational identity	<u>Drawbacks:</u> difficult to integrate abstract critical thinking/ problem solving skills that can be ported across workplaces	<u>Benefits:</u> personalized, includes preparation for multiple postsecondary options promotes lifelong learning

	Traditional academic model (college prep)	Traditional vocational model (apprenticeship)	Regional college and career pathways model
Content	<i>Standardized</i>	<i>Customized</i>	<i>Modular</i>
	<u>Description:</u> core academic courses supplemented by electives and extracurriculars	<u>Description:</u> - occupation-based technical content, on-the-job learning - supplemented by classroom content	<u>Description:</u> technical/academic content offered through both classroom courses and work-based learning includes core academic content
	<u>Drawbacks:</u> - limited career advising/exploration - limited opportunities to develop occupational identity	<u>Drawbacks:</u> difficult to integrate abstract critical thinking/ problem solving skills that can be ported across workplaces	<u>Benefits:</u> personalized, includes preparation for multiple postsecondary options promotes lifelong learning
Content delivery	<i>Singular</i>	<i>Distributed</i>	<i>Networked</i>
	<u>Description:</u> responsibility of classroom teachers in traditional facilities	<u>Description:</u> - responsibility of work supervisors and co-workers - supplemented by classroom instructors	<u>Description:</u> technical skills and workplace competencies delivered in classrooms and by employers academic content delivered in traditional facilities
	<u>Drawbacks:</u> - classroom learning divorced from workplace competencies - difficulty updating content to reflect changes	<u>Drawbacks:</u> - academic content not adequately incorporated - student experiences vary in quality	<u>Benefits:</u> distributes cost of training and education across stakeholders facilitates educator-employer interactions that can improve content delivery over time

Recommendations: New Delivery Models

- The Trifecta – incumbent workers, H.S., CC students in CCs
- Youth Apprenticeships and “Apprenticeship Light”
- CC funding and improve the completion rate
- Short programs (connected to degrees)
- Regional workforce efforts by groups of employers, w/state, CCs
- Integrated federal programs at the state level
- New labor market information systems
- New education technologies – *a key to scale-up needed*
- *Coronavirus brought home the importance of workforce education in addressing our inequality – will we act?*



Thank You!