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Career Clusters: Forecasting HS-PS Jobs Using Labor Market Data



Agenda

- The Report – Pradeep Kotamraju
- Impact and Policy Implications – Kim Green
- Crosswalking – Bruce Steuernagel
- POS, LMI and the Future of CTE: A few thoughts – Jim Stone



Pradeep Kotamraju, Ph.D.

Deputy Director

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**USING LABOR MARKET INFORMATION WITHIN
A PROGRAM OF STUDY CONTEXT: THE CAREER
CLUSTERS REPORT**



A First Look



CAREER CLUSTERS

FORECASTING DEMAND FOR
HIGH SCHOOL THROUGH
COLLEGE JOBS 2008-
2018

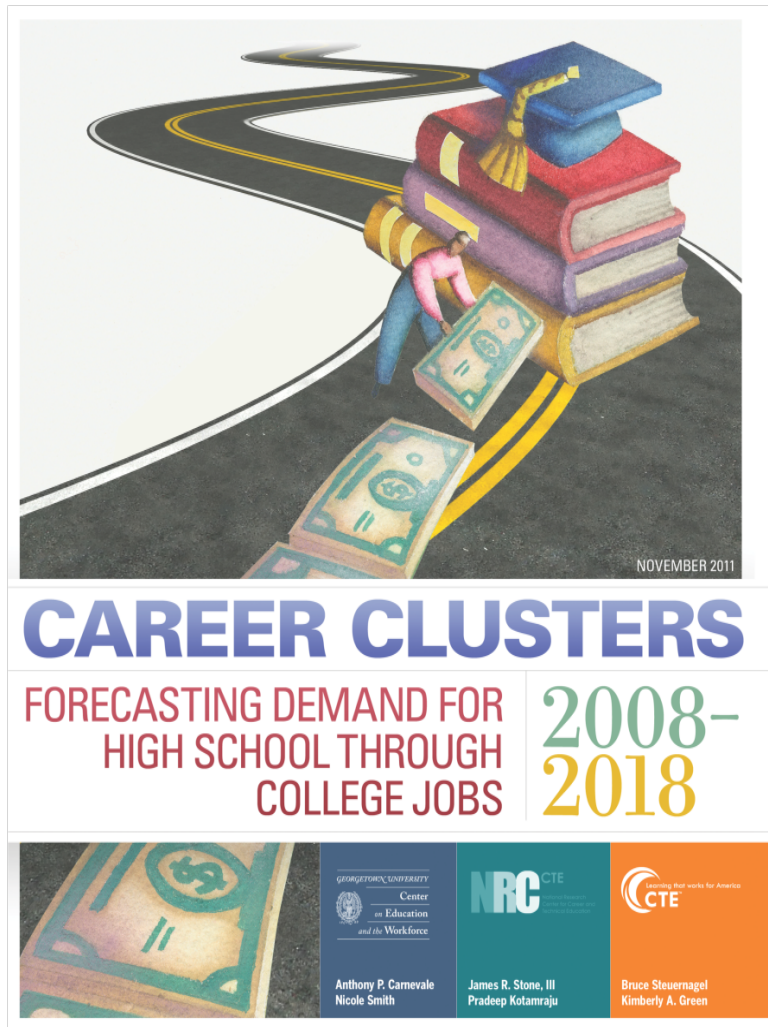


Key highlights:

- While jobs for **workers with high school diplomas** are in **decline**, they still exist.
- **Jobs for middle skill workers** (jobs for workers with some college, a certificate, or an Associate's degree) will make up **29% of the workforce by 2018**.



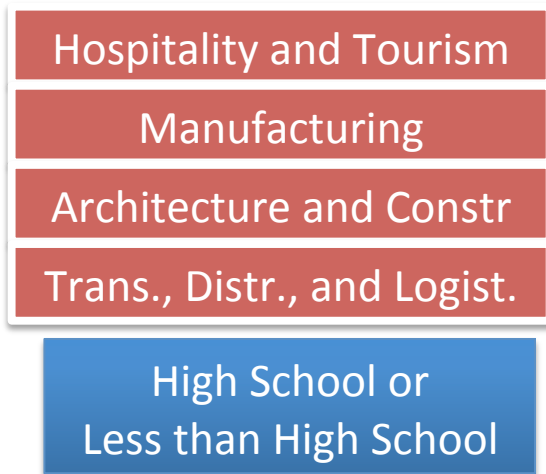
More Key Highlights



- **Manufacturing** will continue to **decline** in total employment, but retiring Baby Boomers will create 2 million job openings. Recent improvements in this sector indicate its continued importance to the American Economy is still strong
- The **gender gap in wages** varies greatly from **cluster to cluster**. For example, the gap in Architecture and Construction is **\$2,000**; in Health Science, it is **\$69,000**. There is little evidence that the gender wage gap **closes** at higher levels of education. If anything, the reverse is true: the gender wage gap seems to **increase** with educational attainment.

How the Report Was Put Together

- The data used for the *Clusters* report is the same as the one in the the 2010 *Help Wanted* Report
- Reorganize data into the 16 career clusters for which a crosswalk was needed.
- Crosswalks connect education programs to occupational information
- Used the crosswalk developed by OVAE (Table 7) available at www.careertech.org



An Implication: Employment opportunities exist at various levels of education but need to balance student interests, employer needs, and supply constraints (OECD report *Learning for Jobs*). Programs of Study/Career Pathways might be one way to do this

Other Key Findings:

- Postsecondary education matters and more of it raises the labor market payoff – but there are jobs available for those with a high school degree or less but they are declining
- Jobs for workers with only a high school diploma or less than high school still exist but are quickly declining, (37% of all job openings by 2018).
- Workers with postsecondary middle skills - some college/no degree or an Associate's degree are a large cluster with varied wage payoffs, (29% of all job openings by 2018).
- Bachelor's degree or better guarantees access to all career clusters but occupation also matters, (34% of all job openings by 2018).



Other Key Findings:

- Postsecondary education matters and more of it raises the labor market payoff – but there are jobs available for those with a high school degree or less but they are declining
- Although old-line manufacturing continues to decline in employment totals, there will be job openings from baby-boom retirements.

The fastest growing clusters have the highest concentration of postsecondary workers.

Women have greater opportunities in middle-skill jobs, but still earn less than men with high school or less.

Inclusion of certifications-preparation should be part of career-ready education.



Occupation Matters

- 43% of young workers with Licenses and Certificates earn more than those with an Associate's degree.
- 27% of young workers with Licenses and Certificates earn more than those with a Bachelor's degree.
- 31% of young workers with Associate's degrees earn more than those with a Bachelor's degree.



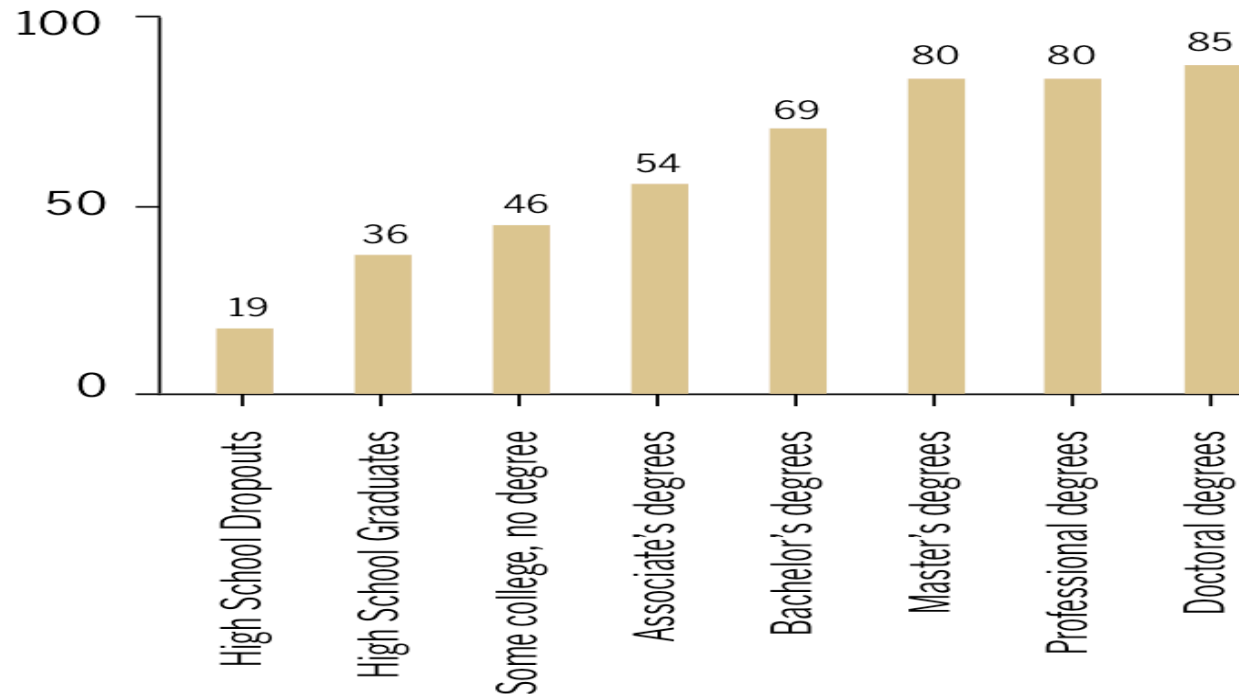
NEW AND REPLACEMENT JOB VACANCIES 2008-2018 (THOUSANDS)						
CAREER CLUSTER	Less than high school	High school diploma	High school diploma or less (%)	Males per cluster (%)	Rate of growth (% change in employment)	Fastest rate of growth (rank)
Manufacturing	420	1,250	9	71	-1	16
Architecture and Construction	760	1,200	11	98	7	11
Transportation, Distribution, and Logistics	560	1,800	13	85	4	14
Hospitality and Tourism	1,670	3,190	27	50	12	6
All other clusters	1,230	5,670	40			

NEW AND REPLACEMENT JOB VACANCIES 2008-2018 (THOUSANDS)						
CAREER CLUSTER	Some college/ no degree*	Associate's degree	Some college/no degree/Associate's degree (%)	Males per cluster (%)	Rate of growth (% change in employment)	Fastest rate of growth (rank)
Manufacturing	600	400	8	79	-1	16
Marketing, Sales, and Service	800	400	9	49	11	7
Transportation, Distribution, and Logistics	900	400	9	81	4	14
Health Science	500	800	10	13	21	2
Business, Management, and Administration	1,100	700	13	31	6	12
Hospitality and Tourism	1,500	800	16	54	12	6
All others	2,900	2,100	36			

There will be jobs available for workers with high school or less, but options for these workers will be limited. The best opportunities to earn a living wage with middle skills are in career clusters where men dominate.

How much you make depends on education level.

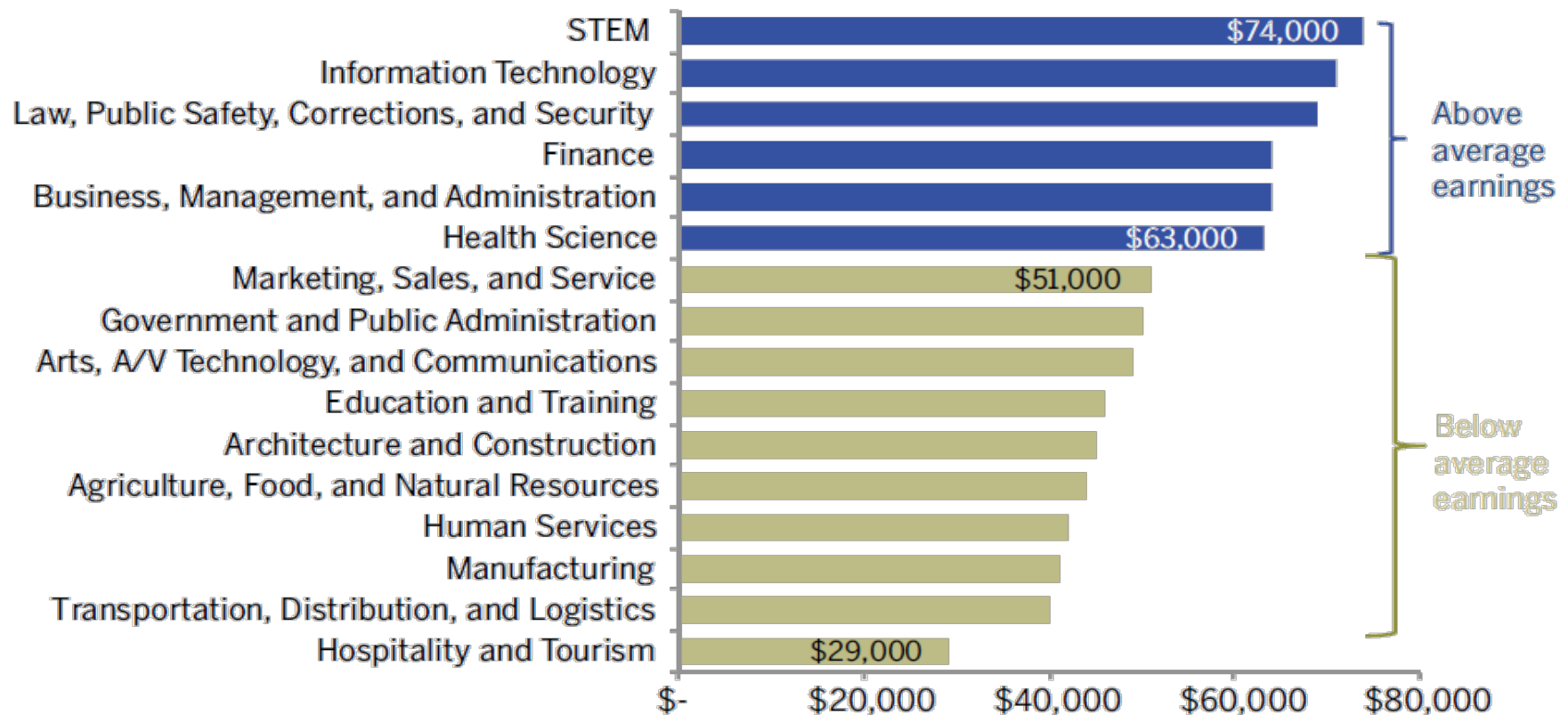
Figure 1.
Percent earning more than \$35k (2010\$)



\$35,000 (2010\$) is defined as the Minimum Earning Threshold (MET) as an absolute poverty-based definition of the earnings level that equals 150% of the federal poverty level (FPL) for a family of four. It can also be considered the wage level necessary to enter into the middle class.

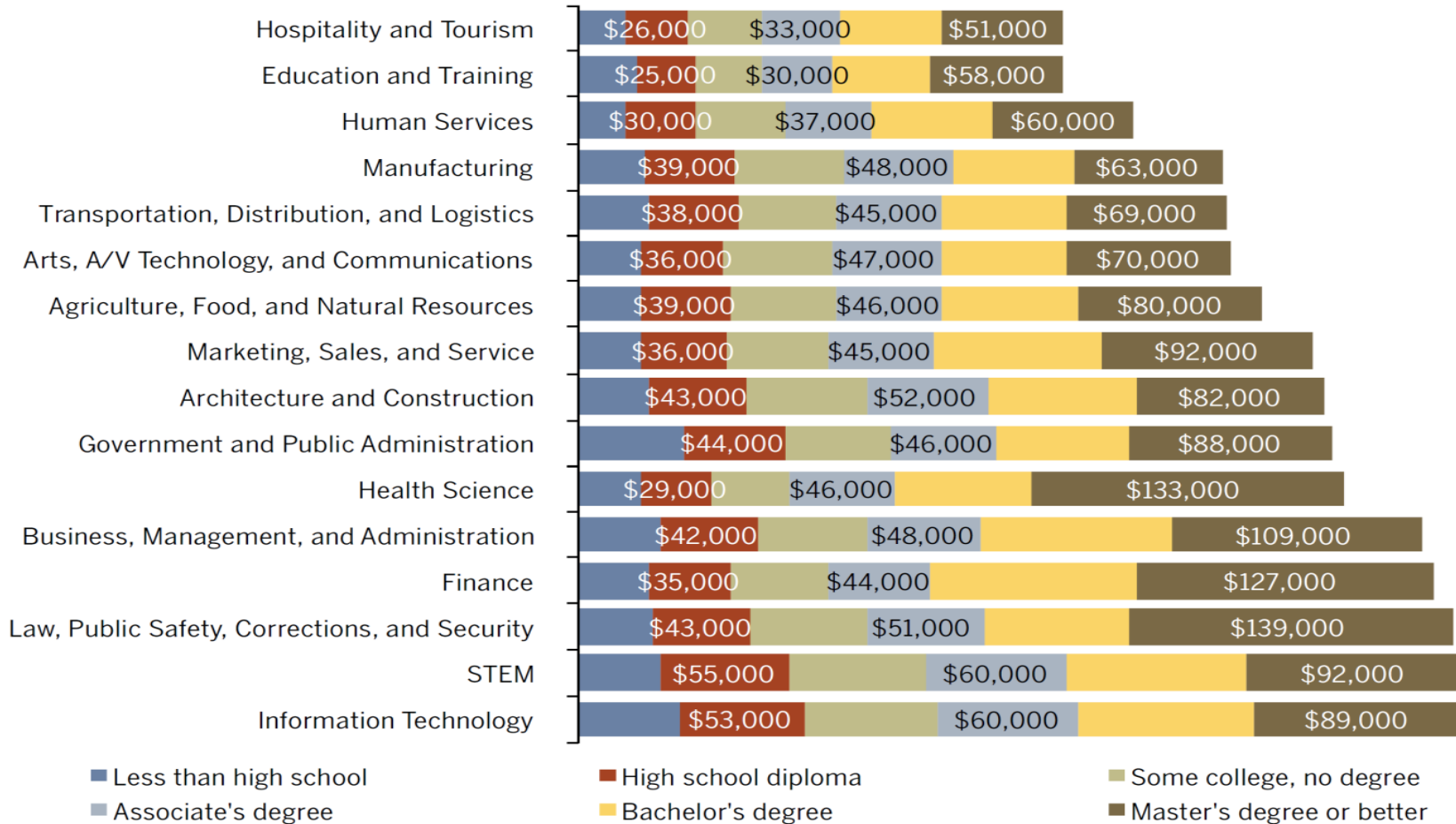
Some clusters offer better opportunities than others to earn a living wage.

Figure 2. STEM prime-age workers earn above-average wages (2009\$)



SOURCE: The American Community Survey (ACS) 2006-2009

Education still determines wages, but occupation also matters.



SOURCE: Analysis of ACS data, 2006

Table 25. Participation and concentration of workers with high school diplomas and postsecondary middle skills working in CTE for top six career clusters by award type and career cluster

Participants	HIGH SCHOOL DIPLOMAS		POSTSECONDARY MIDDLE SKILLS			
	Concentrators	Less than 1 year	At least 1 but less than 2 academic years	Associate's degree	At least 2 but less than 4 years	Total, all award levels
Business	Manufacturing, repair, and transportation	Health sciences	Health sciences	Health sciences	Health sciences	Health sciences
Communications and design	Business	Manufacturing, construction, repair, and transportation	Consumer services	Business management	Manufacturing, construction, repair, and transportation	Manufacturing, construction, repair, and transportation
Manufacturing, repair, and transportation	Agriculture and natural resources	Consumer services	Manufacturing, construction, repair, and transportation	Engineering, architecture and science technologies	Consumer services	Consumer services
Consumer and culinary services	Consumer and culinary services	Protective services	Business management	Protective services	Public, legal, and social services	Business management
Computer and information sciences	Health sciences	Business management	Engineering, architecture and science technologies	Computer and information sciences	Engineering, architecture and science technologies	Protective services
Engineering technologies	Communications and design	Business support	Business support	Consumer services	Computer and information sciences	Engineering, architecture and science technologies

Implications

- CTE students are participating in clusters beyond the “old line” clusters such as business and computer and information sciences implying that high school graduates are enrolling and completing courses that teach basic skills required for today’s economy
- Several career clusters are the same for participants and concentrators indicating that some students are involved in career preparation in a single area intensively at the high school level
- By being placed as the top post-secondary career cluster, health sciences seems to follow a well-defined pathway with programs at the high school and post-secondary levels



More Implications

- Studies in manufacturing, construction, repair, and transportation are more prevalent at the associate degree level but at the high school it is possible that students are mixing and matching CTE courses in these areas that cannot be readily seen by aggregative data
- At the secondary level, students are choosing career clusters in which math and science knowledge requirements for employment are increasing but how much is necessary is still a debatable proposition.
- Studies in manufacturing, construction, repair, and transportation are more prevalent at the associate degree level implying student choices seem to match what is required for the new economy



Kimberly Green.

Director

National Association of State Directors of Career &
Technical Education

IMPACT AND POLICY IMPLICATIONS



Bruce Steuernagel,
Consultant, NASDCTEc and NRCCTE

CAREER CLUSTERS: USING AND IMPROVING LMI



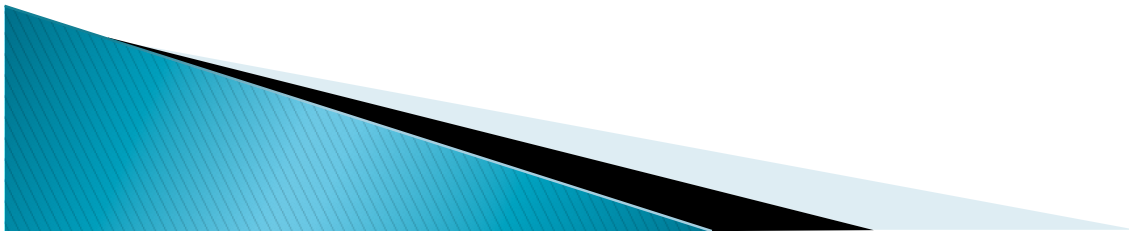
Career Clusters Report

- The report assembled occupational labor market information (LMI) into the 16 Career Clusters.
- Enables CTE program planners to better understand their area's labor market.
- Helps to develop POS that are aligned with demand.
- Provides valuable career information to students



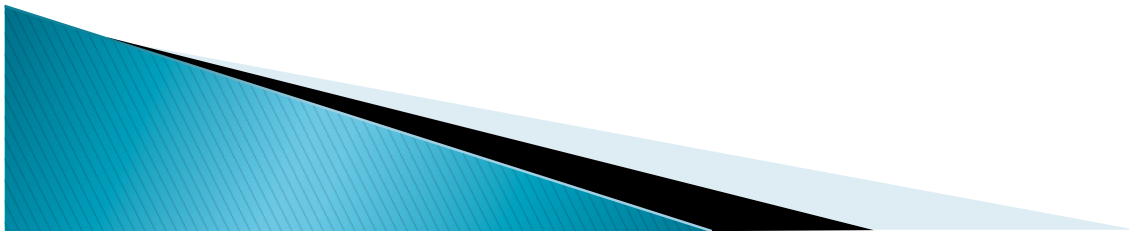
What do we mean by LMI?

- ▶ Data available on a particular geographic area that includes:
 - industry employment, hours and earnings
 - unemployment estimates
 - industry and occupational employment projections
 - wage information, including level and trend
 - industrial average hours and earnings data
 - job vacancy surveys to estimate number and rate
 - typical education and training level required
 - supply of graduates from related training programs



Sources of LMI

- ▶ Most industry and occupational employment and wage data are collected by state economic security agencies in cooperation with BLS
- ▶ Additional labor force characteristic data, such as gender and educational attainment, are collected by Current Population Survey and the Census Bureau's American Community Survey
- ▶ Post-secondary educational data collected by National Center for Education Statistics through the IPEDS survey



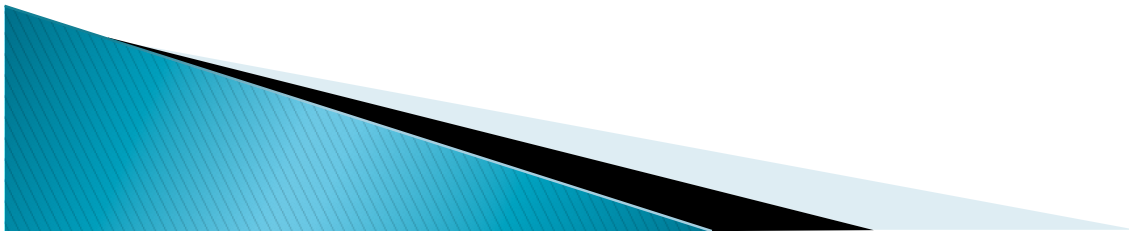
Examples of questions answered

- ▶ Which Career Cluster is projected to have the most job openings? Which is fastest growing?
- ▶ What level of education is typically required for jobs in this Career Cluster? To what extent is there up-skilling in the Cluster?
- ▶ Which Career Clusters have above-average wages?
- ▶ High-demand; High-skill; High-wage



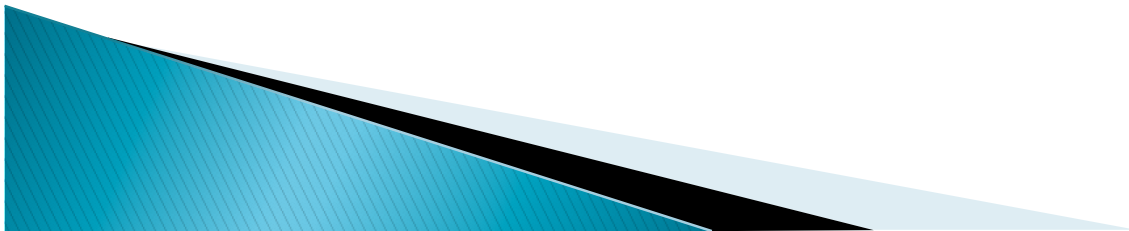
The importance of Cluster definition

- ▶ The Career Cluster data in the report is based on the current unique assignment of occupations (SOCs) to the 16 Career Clusters
 - Crosswalk developed by OVAE in 2006–2007.
Perkins Table 7
- ▶ The Career Clusters are a mixture of industry-based and function-based occupations
 - Industry: Manufacturing, Transportation, Health
 - Function: Marketing, Information Technology



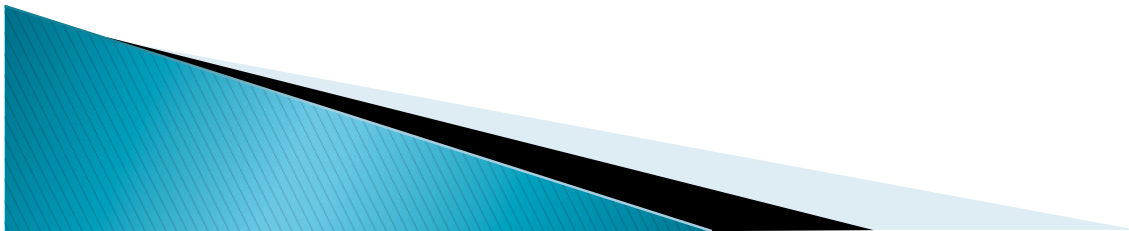
The importance of Cluster definition

- ▶ Using a different Cluster definition (group of occupations) could produce some different results
 - STEM and IT are two separate Career Clusters, but other STEM definitions (i.e. NSF) include scientists, math, IT and social science occupations.
 - Pathway changes would affect the assignment of occupations to clusters. For example, there now is an Accounting Pathway in the Finance Cluster. Accountants are currently in the Business Cluster



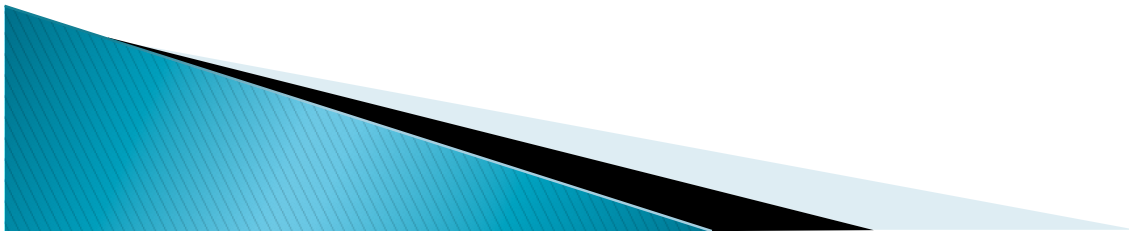
Current Crosswalk Validation Project

- ▶ Project initially focused on CIP assignments to cluster because of need to have national standardization for accountability reporting
- ▶ There was concern among the State Directors regarding the assignment of particular CIPs to particular Clusters.



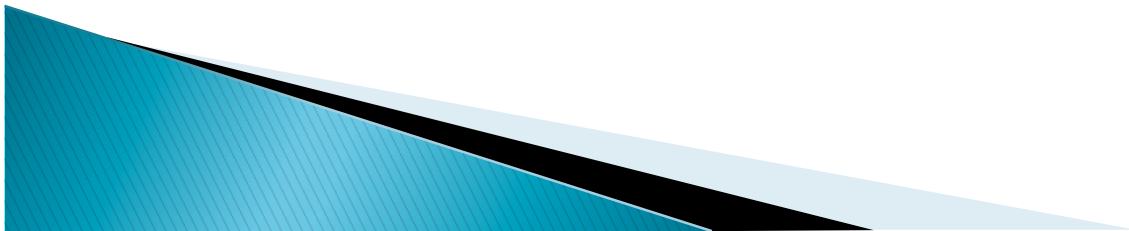
Process

- ▶ Compare the Table 7 CIP Cluster assignment to the OSDS Unit of Analysis Cluster assignment
- ▶ Recommend adjustments, if necessary, based on decision rules that take into consideration:
 - Employment by industry of occupations related to the program
 - Skills (i.e. agricultural journalist; Ag or Arts/Comm.)
 - Existing pathway definitions; Accounting, Marketing



Status

- ▶ Recommendations have been sent to a group of experts for their review and recommendations
 - Response requested by March 15th
- ▶ Convert the CIPs to CIP 2010
 - Delete old CIPs and add new ones to revised Table 7 Cluster assignment
- ▶ Apply 2010 CIP–SOC Crosswalk to arrive at revised Table 7 Occupation/Cluster assignment
 - Review for consistency and reasonableness



POS, LMI AND THE USE OF LABOR MARKET INFORMATION IN CTE

James R. Stone III

Director

NRCCTE



A Few Thoughts

1. Labor market data provide possible targets for CTE programing but..
 - Education about work and working
 - Education through work to achieving academic ends
 - Education for work to prepare for tomorrow's workplace
2. CTE offers many means for achieving the multiple targets for today's students



Pedagogies of Quality CTE

- Classroom instruction



- *Project based learning*
- *Contextualized learning*

- **Work based learning-WBL**



- **Labs**
- **Shops**
- **Job shadowing**
- **Internships**
- **School-based enterprise**
- **Cooperative education**
- **Apprenticeships**

- **CTSOs**



- **Leadership development**
- **Professional development**
- **Service/social engagement**
- **Competitive events**



Two Approaches

- Long-Term Labor Market Projections
- Short-term – e.g., *Burning Glass-Real Time Labor Market Intelligence*
- Sector Strategy Analysis
- Links long term government policy targets to specific industry clusters



Kentucky's Target Industry Sectors



Health Care



Automobile & Aircraft Mfg



Transportation, Distribution & Logistics

- Energy Creation/ Emission



Business Services/R&D



Built Upon Career Development

A Developmental ILP that Drives Program
Choice & Student Course Assignments

Employment: Career Advancement

Continuing Education and Lifelong Learning

Postsecondary: Career Preparation

Achieving credentials: college, certification, apprenticeship, military

9-12: Career Preparation

Academics and technical courses, intensive guidance, individual graduation plans

Grade 8: Transition

Choosing a health career focus (can change easily at any time later)

6-8: Career Exploration

Discovering interest in health careers - Begin Individualized Graduation Plan

K-5: Career Awareness

Introduction to health careers



Framed Within a Program of Study

- Incorporates *secondary education and postsecondary education* elements;
- Includes coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, *non-duplicative progression of courses* that align secondary to postsecondary education;
- Leads to an *industry-recognized credential* or certificate at the postsecondary level or an associate or baccalaureate degree; and
- May include opportunity for secondary education students to gain postsecondary education credits through *dual or concurrent enrollment* programs or other means.
- *K-12, Community College, Industry Based Models*

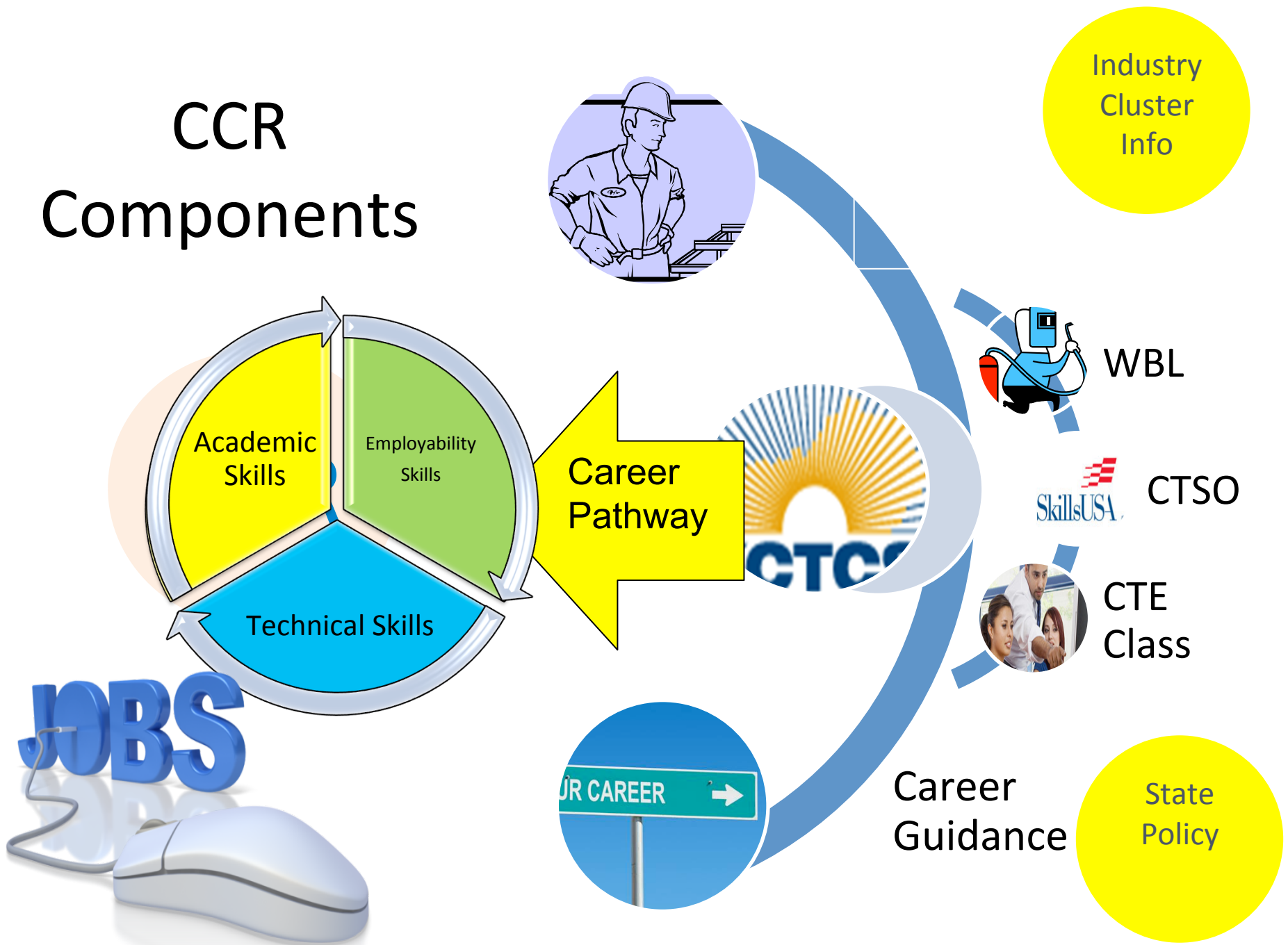


Early Lessons From POS Studies

- Partnerships
- Career Guidance/Development
- ***National Programs of Study Institute***



CCR Components



One Final Thought

- High school is the last education opportunity paid for wholly by the public. Its purpose has to be to do the best it can to provide all who leave it the foundation necessary to enter, or further prepare for, adult life. - Barton, 2006***



Questions? Comments?

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