ARKANSAS RESEARCH CENTER

Arkansas Department of Career Education

UCONN NEAG SCHOOL OF EDUCATION

Career and Technical Education in Arkansas: Improving Student Outcomes

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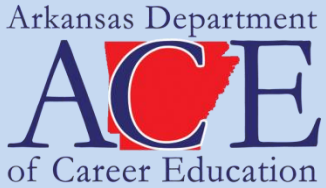
Partners and Stakeholders



Data Sources

Nationally, what do we know about the efficacy of CTE?

- Career and technical education has increasingly been a buzzword over the last several years, in part driven by CCSS focus on college and career readiness (US DOE, 2012)
- Prior work on the effects of CTE on student outcomes show positive effects on wages, (Bishop & Mane, 2004; Kemple, 2008; Neumark & Rothstein, 2006; Page, 2012)
- Evidence of the effects of CTE participation on academic outcomes is more mixed with less strong causal identification.
- Recent work in Massachusetts on Regional Technical Schools shows promising impacts on high school completion (Dougherty, 2015), but also evidence of less CTE course taking in high stakes testing era (Kreisman & Stange, 2015)
- Focus of policy in Arkansas provides a nice opportunity to understand whether CTE course taking effects student high school completion, college going, and labor market outcomes

Recent report from the Fordham Institute

Study Background

- Funded by the Fordham Institute
- Conducted by the University of Connecticut
- Data from the Arkansas Research Center's Longitudinal Data System at the University of Central Arkansas
- Comparing higher education and workforce outcomes of CTE to Non-CTE student from AY2009-AY2011
- Program of study, gender, race, meal status, and disability classification

Research Questions

1. WHICH STUDENTS ARE TAKING CTE COURSES? WHICH COURSES – AND HOW MANY OF THEM – ARE THEY TAKING?

2. DOES GREATER EXPOSURE TO CTE IMPROVE EDUCATION AND EMPLOYMENT OUTCOMES?

3. DOES CTE CONCENTRATION HAVE BENEFITS FOR STUDENTS? DO CERTAIN STUDENTS BENEFIT MORE THAN OTHERS?

Data and Methods

- Over 100,000 students in over 725,000 CTE courses
- Three cohorts of 9th Graders from AY09, AY10, and AY11
- Followed through one year after graduation
- Data comes from the Arkansas Research Center's Longitudinal Data System that contains data from PK-12th Grade, Higher Education, Adult Education, GED, Career and Technical Education, Workforce Services and others.
- Definition of "concentrator" is specific to this research and is not that used by ACE.
- Concentrator is defined as taking a sequence of three or more courses in an occupationally aligned "program of study"

Cohorts

TABLE 1 | COHORT DATA

	Cohort 1	Cohort 2	Cohort 3
One year after high school	2012-13	2013-14	2014-15
Twelfth Grade	2011-12	2012-13	2013-14
Eleventh Grade	2010-11	2011-12	2012-13
Tenth Grade	2009-10	2010-11	2011-12
Ninth Grade	2008-09	2009-10	2010-11
Number of students	36,090	35,985	32,358

How do students access CTE?

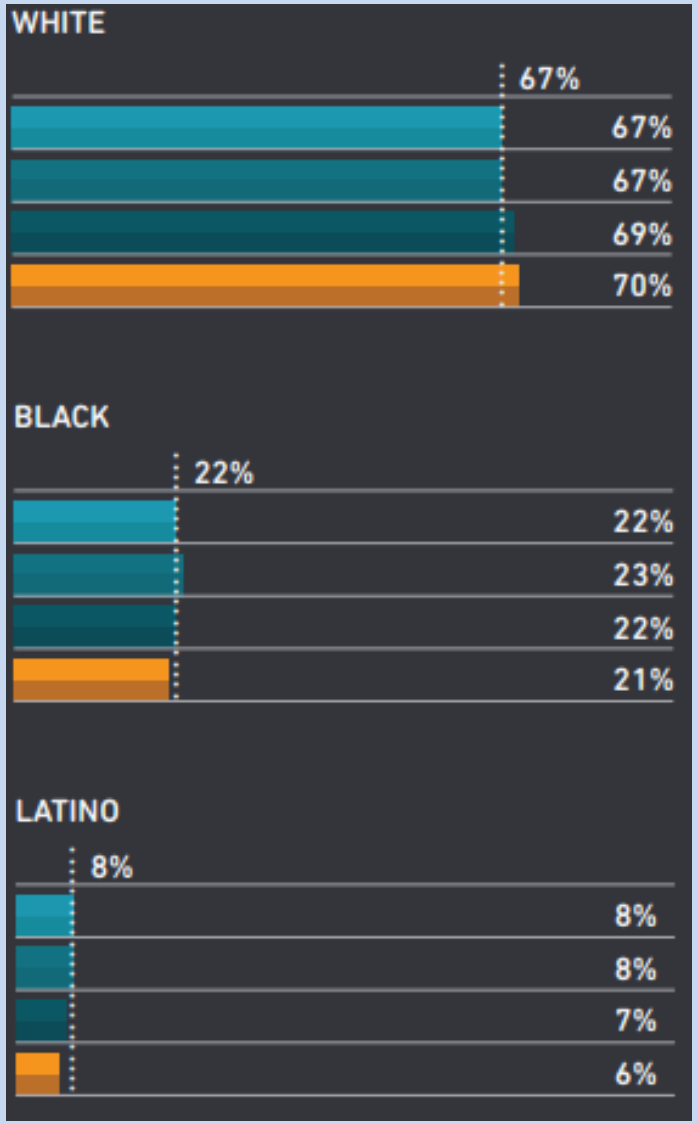
- Perkins legislation requires that all students have some access to CTE in high school
- Type and number of programs vary widely, as do contexts where classes are taken:
  - Comprehensive high school programs (CHS)
  - Part-time technical centers to supplement (CHS)
  - Technical high schools where all students specialize in CTE
    - Grades 9-12
  - Community colleges
  - Technical/ Trade schools

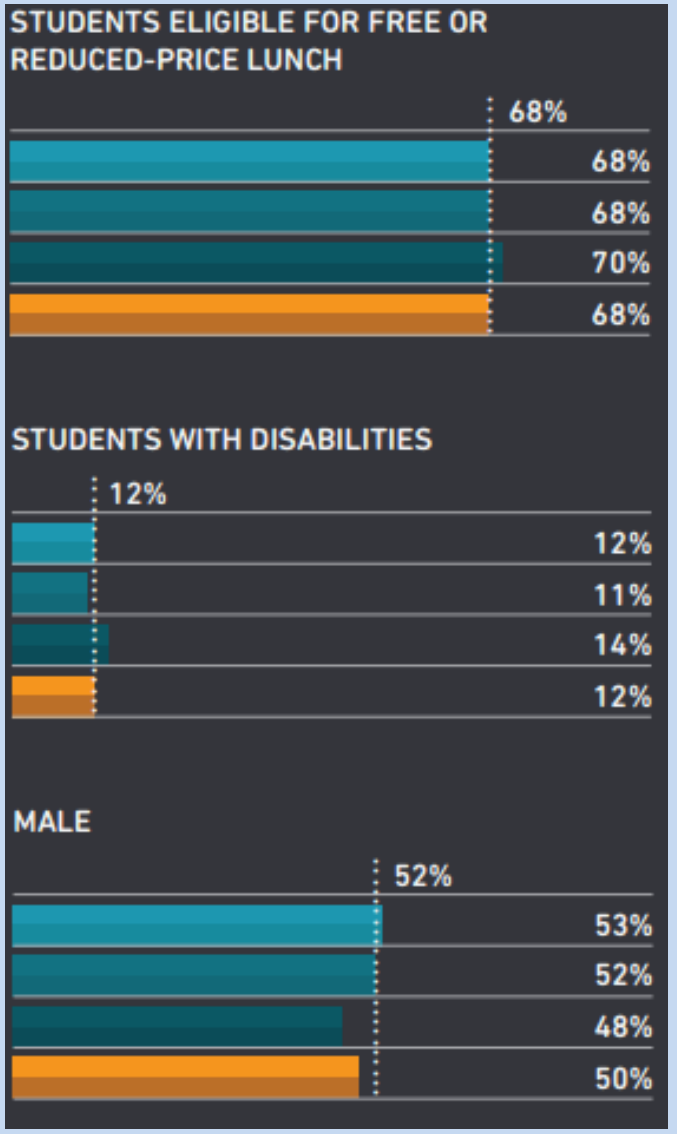
Which students are taking CTE courses?

- Overall representative of the overall student population

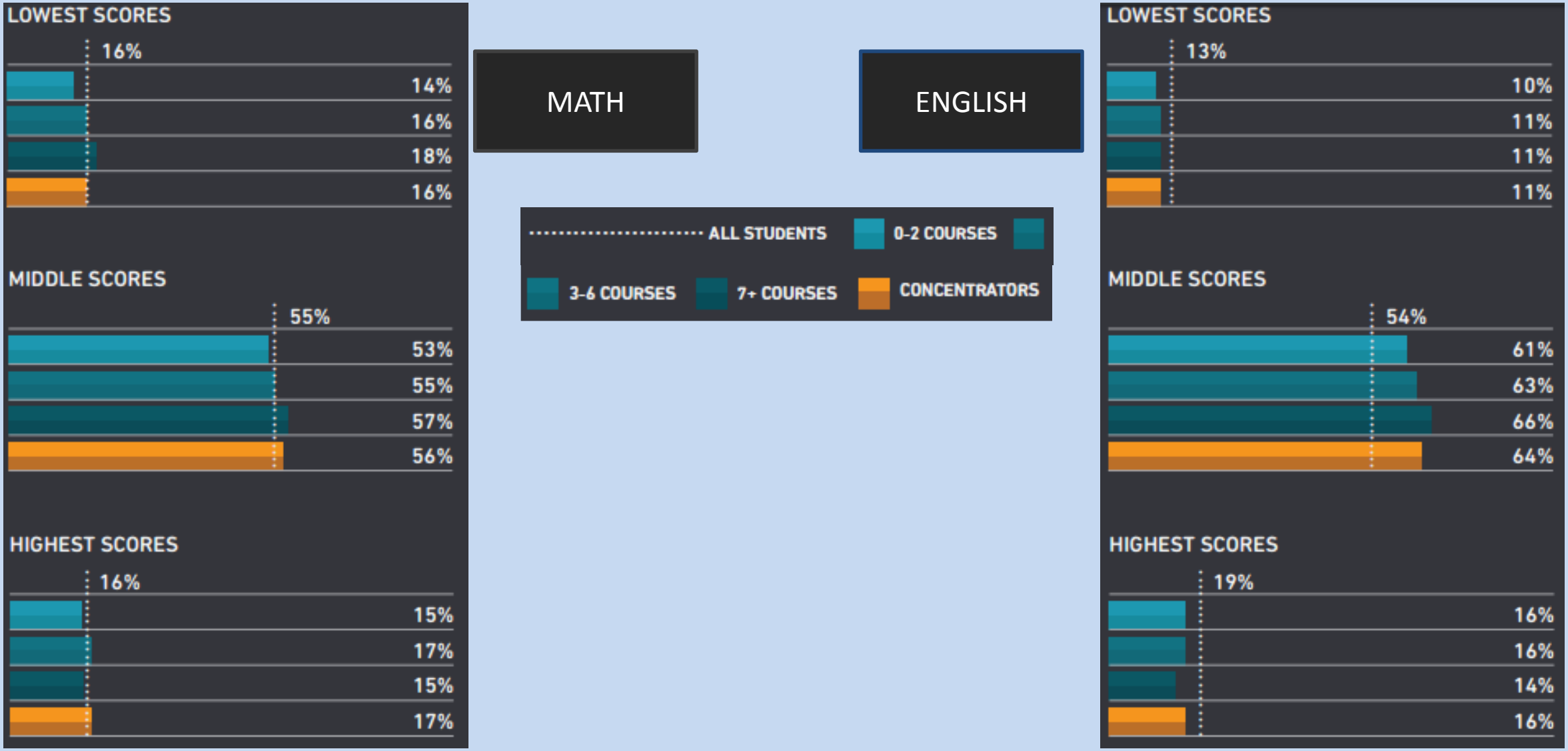
- Exposure varied though by certain characteristics
  - Race
  - Disability Status
  - Income Status/Free and Reduced Lunch Status
  - Gender
  - Math Achievement
  - Literacy Achievement

Who is represented in CTE?—Demographics





Who is represented in CTE?—Academic Performance



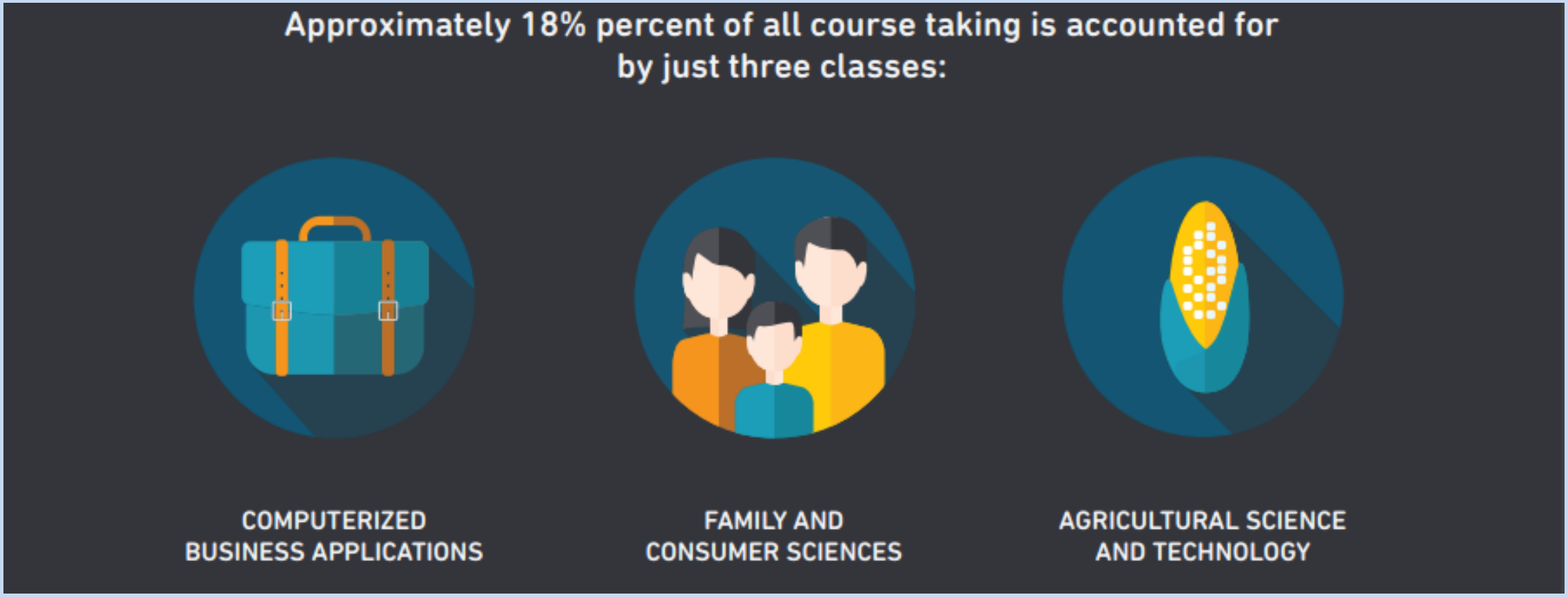
Which courses-and how many of them-are they taking?

- 89% took at least 1 CTE course in high school

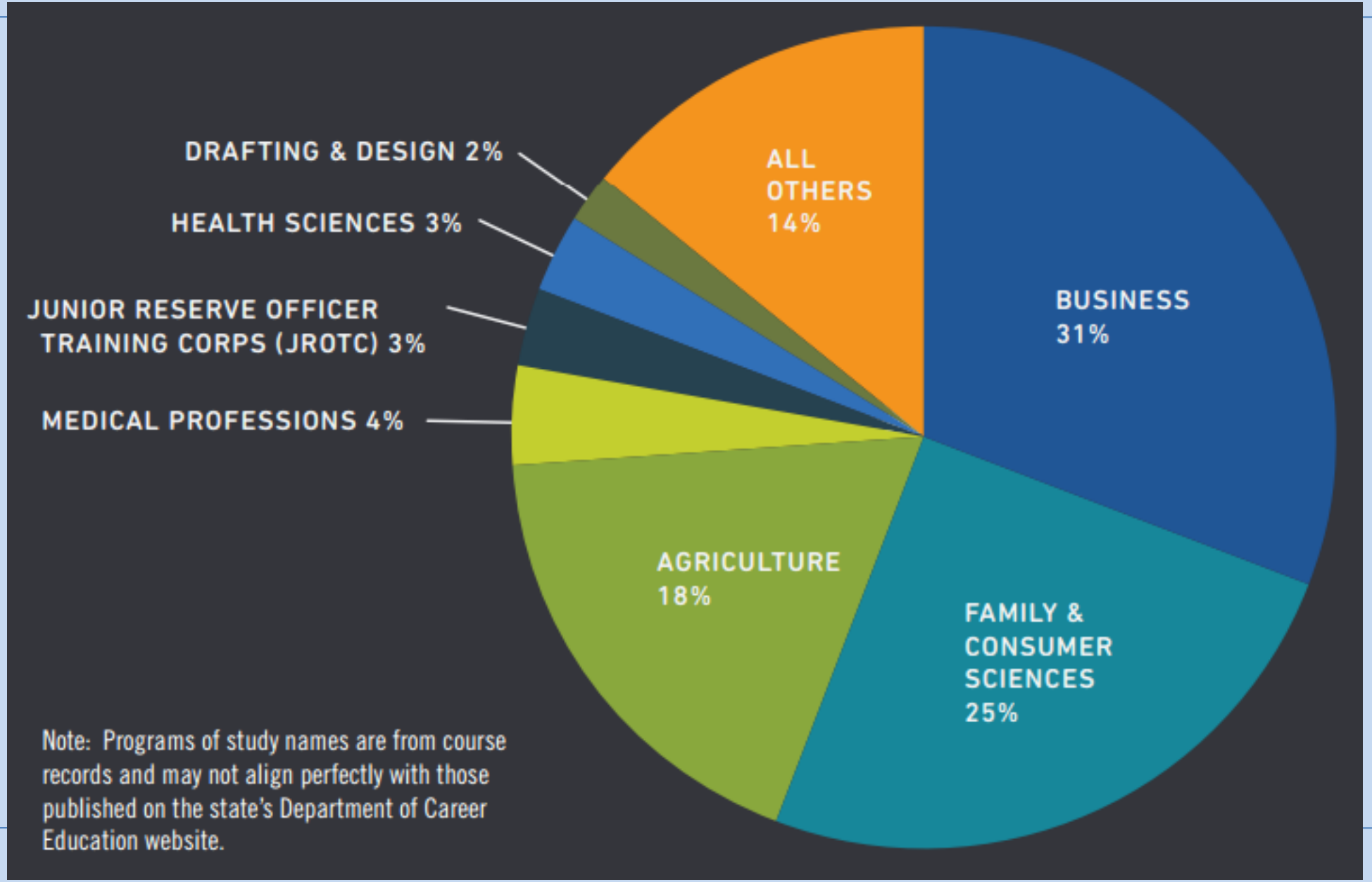
- 4.9 CTE courses vs the national average of 3.5
  - Concentrators took an average of 8.5 courses
  - Non-Concentrators took an average of 3.4 courses

- Number of courses taken
  - 30%-2 or fewer courses
  - 39%-3-6 courses
  - 31%-7 or more courses

Most Popular CTE Courses



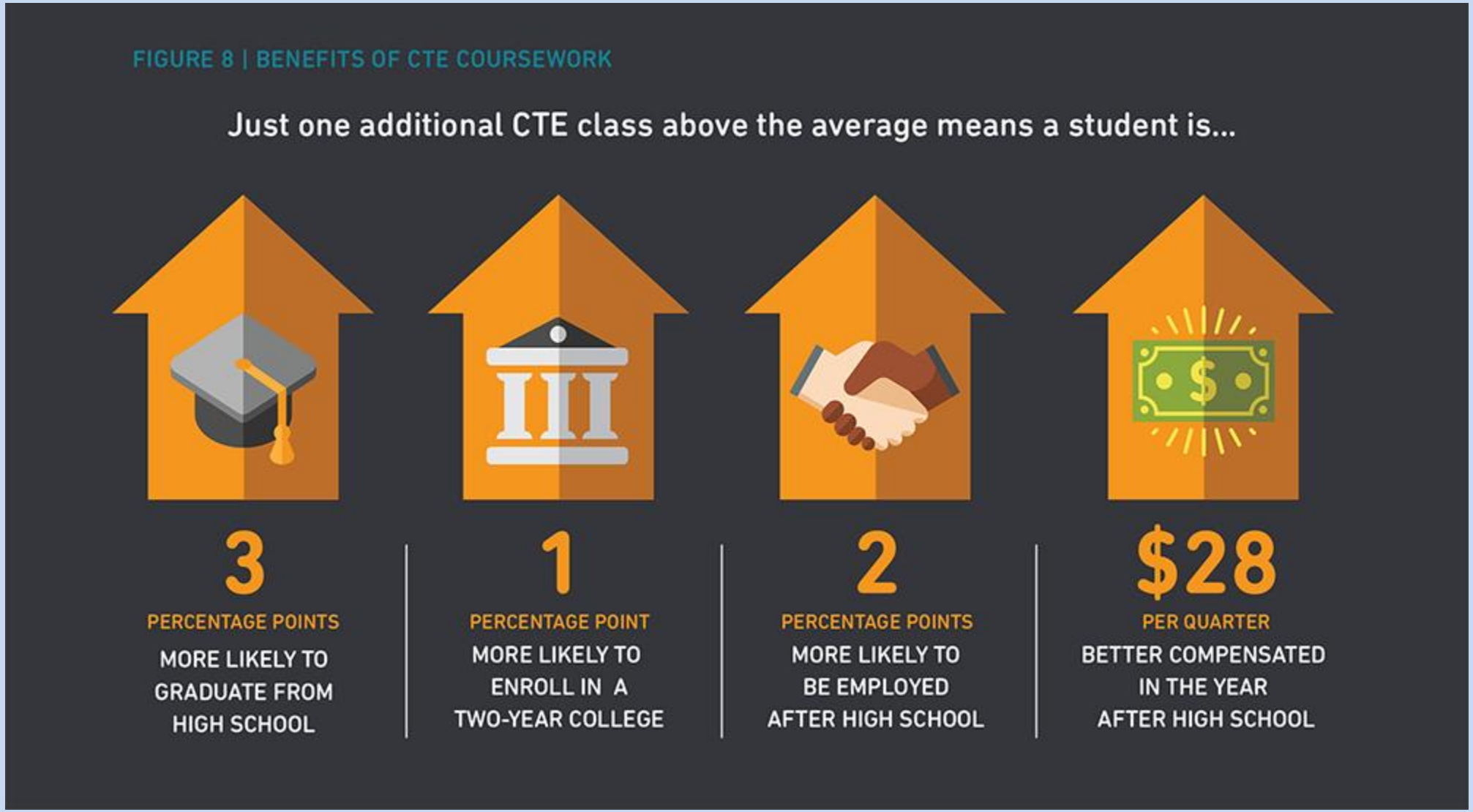
Where are the concentrators?—Most Popular Programs of Study



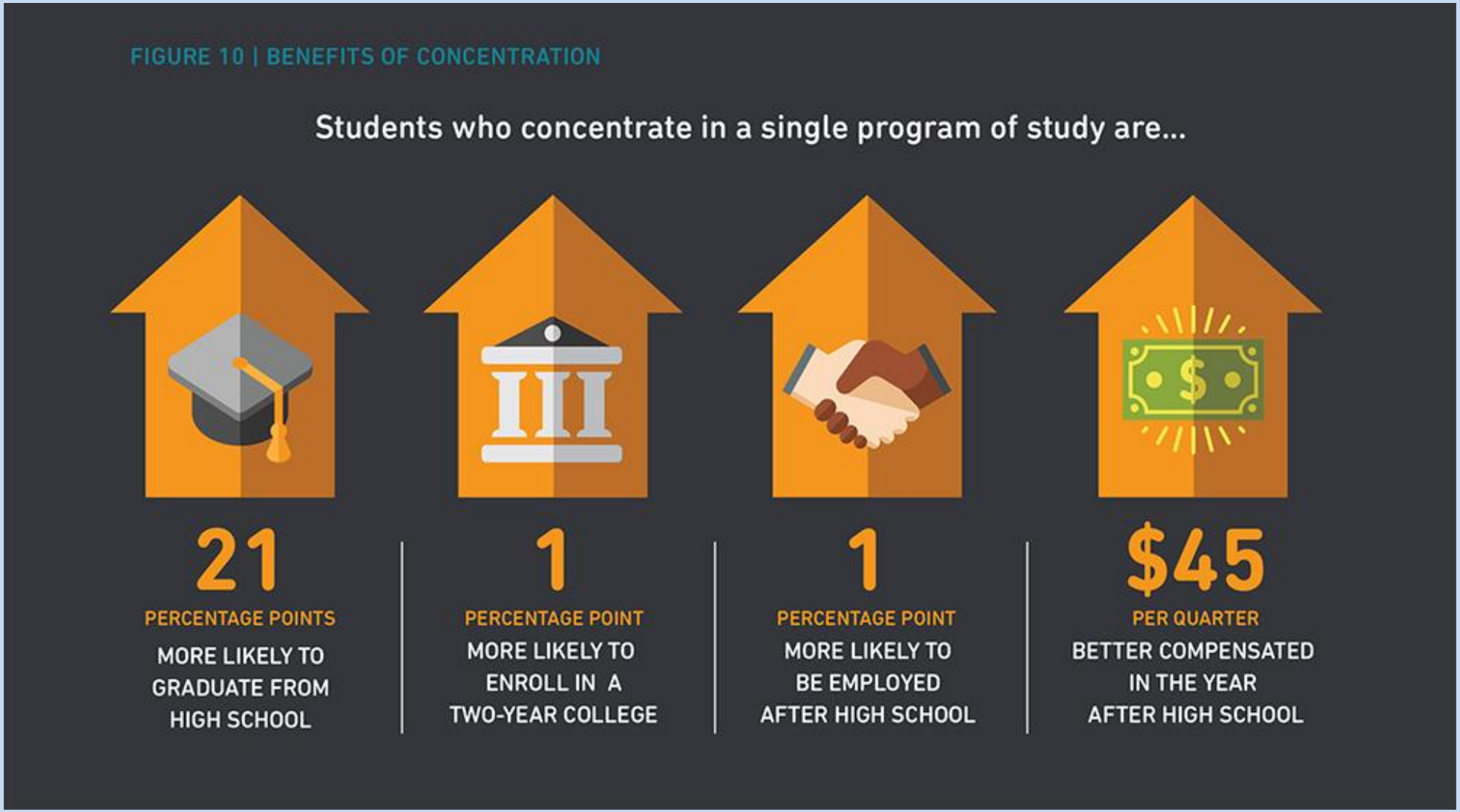
Where are the clusters taught?—Location of Clusters

Industry Cluster	City	Suburb	Rural
Agriculture, Food, and Natural Resources	6.0%	29.6%	18.7%
Architecture and Construction	5.6%	1.7%	3.6%
Arts, A/V Technology, and Communications	7.8%	0.8%	2.9%
Business Management and Administration	3.0%	1.9%	2.2%
Education and Training	2.2%	0.6%	1.1%
Finance	2.7%	1.2%	2.3%
Government and Public Administration	4.7%	2.1%	5.1%
Health Sciences	14.9%	4.7%	10.8%
Hospitality and Tourism	2.1%	0.8%	1.2%
Human Services	18.8%	25.6%	20.7%
Information Technology	12.2%	23.6%	19.1%
Law, Public Service, Corrections, and Security	2.7%	1.0%	1.4%
Manufacturing	2.7%	2.1%	3.1%
Marketing	6.6%	0.7%	2.6%
STEM	4.2%	0.7%	1.3%
Transportation, Distribution, and Logistics	3.0%	2.0%	3.1%

How does CTE course taking impact student outcomes?



What are the benefits of concentrating, are all effects equal?



Outcomes by Concentration

	Agriculture, Food, and Natural Resources	Architecture and Construction	Arts, A/V Technology, and Communications	Business Management and Administration	Education and Training	Finance	Government and Public Administration	Health Sciences
Total CTE Courses Taken	9.04	7.97	6.88	8.32	7.91	7.84	6.76	9.44
Dual Enrollment Status	10.3%	10.7%	15.8%	13.4%	16.7%	20.5%	8.6%	25.9%
Graduated High School	94%	93%	94%	95%	96%	96%	91%	95%
Enrolled in 2-Year	15.4%	10.7%	24.6%	17.9%	19.8%	23.5%	11.7%	37.8%
Enrolled in 4-Year	6.4%	9.3%	10.1%	8.7%	11.6%	12.9%	4.1%	11.4%
Avg. Quarterly Wages	$1,128.58	$1,192.03	$864.05	$949.84	$917.90	$907.48	$894.80	$936.31
Annualized Wages	$4,514.32	$4,768.12	$3,456.20	$3,799.36	$3,671.60	$3,629.92	$3,579.20	$3,745.24

	Hospitality and Tourism	Human Services	Information Technology	Law, Public Service, Corrections, and Security	Manufacturing	Marketing	STEM	Transportation, Distribution, and Logistics
Total CTE Courses Taken	8.72	8.59	8.47	7.96	8.11	6.98	7.56	7.85
Dual Enrollment Status	13.0%	12.7%	15.6%	27.1%	35.5%	12.7%	25.6%	28.5%
Graduated High School	94.3%	91.2%	92.1%	91.7%	91.2%	90.0%	93.2%	92.0%
Enrolled in 2-Year	20.3%	16.4%	20.8%	36.9%	41.6%	13.8%	28.6%	41.5%
Enrolled in 4-Year	8.9%	6.9%	11.0%	4.7%	9.9%	5.7%	12.4%	7.0%
Avg. Quarterly Wages	$953.91	$938.11	$895.99	$1,115.53	$1,348.74	$1,249.13	$853.44	$1,480.28
Annualized Wages	$3,815.64	$3,752.44	$3,583.96	$4,462.12	$5,394.96	$4,996.52	$3,413.76	$5,921.12

Do certain students benefit more than others?

- 4-year High School Graduation Rate
  - Concentrators-93%
  - Non-Concentrators-51%

- College Enrollment
  - Concentrators-28%
  - Non-Concentrators-20%

- Employment
  - Concentrators-64%
  - Non-Concentrators-53%

- 1st Year Quarterly Earnings
  - Concentrators-$1,016
  - Non-Concentrators-$792

Summary of 5 Key Findings

1. Most students in Arkansas take CTE with limited evidence of “tracking.”
2. White and female students are more likely to concentrate, and some concentrations are more or less popular depending on a student’s gender, race, income level, and disability status.
3. The more CTE courses students take, the better their education and labor market outcomes.
4. Students who concentrate see additional benefits, especially when it comes to high school graduation.
5. Male and low-income students see the largest benefits to concentrating in a CTE program of study.

What can be taken from the case of Arkansas?

- Other states and districts:
  - Invest more heavily in high-quality CTE
    - Aligned with labor-market demand with ability to adjust dynamically
    - Encourage pursuit of industry-recognized credentials valued by employers
    - Organize offerings to facilitate completion of a concentration
    - Harmonize dual enrollment to allow for credential “stacking” into college
- Federal reauthorization of Perkins:
  - Incentivize access to high-quality STEM
  - Allow for a diversity of delivery models
- Caveats for cities
  - There is some evidence that programs in cities have not evolved as quickly, and that some tracking may yet be occurring in Massachusetts and Connecticut

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	Agriculture, Food, and Natural Resources	Architecture and Construction	Arts, A/V Technology, and Communications	Business Management and Administration	Education and Training	Finance	Government and Public Administration	Health Sciences
Male	0.739	0.863	0.474	0.487	0.143	0.493	0.571	0.228
White	0.857	0.645	0.709	0.638	0.712	0.7	0.544	0.628
Black	0.081	0.239	0.171	0.255	0.126	0.218	0.384	0.238
Latino	0.04	0.083	0.09	0.076	0.119	0.051	0.032	0.094
Low Income	0.653	0.636	0.556	0.659	0.558	0.595	0.799	0.675
Students with Disabilities	0.186	0.18	0.111	0.114	0.085	0.045	0.185	0.062
English Language Learners	0.023	0.044	0.05	0.046	0.061	0.027	0.016	0.058
Years in CTE Courses	3.913	3.959	3.849	3.913	3.88	3.835	3.891	3.982
Total CTE Courses Taken	9.037	7.968	6.883	8.318	7.914	7.836	6.764	9.439
Dual Enrollment Status	0.103	0.107	0.158	0.134	0.167	0.205	0.086	0.259
Graduated High School	0.94	0.931	0.944	0.946	0.958	0.96	0.913	0.95
Initially Enroll, 2-Year College	0.154	0.107	0.246	0.179	0.198	0.235	0.117	0.378
Initially Enroll, 4-Year College	0.064	0.093	0.101	0.087	0.116	0.129	0.041	0.114
Initial Average Quarterly Wage	1128.575	1192.029	864.05	949.837	917.896	907.483	894.796	936.314
Literacy Z-Score, Grade 11	-0.229	-0.265	0.206	0.003	0.247	0.243	-0.263	0.108
N (students)	5458	532	724	2458	302	882	705	2094

	Hospitality and Tourism	Human Services	Information Technology	Law, Public Safety, Corrections, and Security	Manufacturing	Marketing	Science, Technology, Engineering, and Mathematics	Transportation, Distribution, and Logistics
Male	0.381	0.3	0.479	0.562	0.895	0.45	0.829	0.948
White	0.562	0.648	0.712	0.643	0.751	0.6	0.686	0.717
Black	0.326	0.261	0.201	0.256	0.172	0.286	0.153	0.186
Latino	0.084	0.061	0.056	0.072	0.058	0.086	0.119	0.086
Low Income	0.72	0.724	0.644	0.738	0.672	0.622	0.581	0.731
Students with Disabilities	0.169	0.166	0.101	0.128	0.248	0.096	0.106	0.288
English Language Learners	0.041	0.036	0.027	0.03	0.033	0.052	0.076	0.048
Years in CTE Courses	3.916	3.923	3.92	3.904	3.927	3.83	3.9	3.942
Total CTE Courses Taken	8.722	8.59	8.466	7.964	8.114	6.984	7.56	7.849
Dual Enrollment Status	0.13	0.127	0.156	0.271	0.355	0.127	0.256	0.285
Graduated High School	0.943	0.912	0.921	0.917	0.912	0.9	0.932	0.92
Initially Enroll, 2-Year College	0.203	0.164	0.208	0.369	0.416	0.138	0.286	0.415
Initially Enroll, 4-Year College	0.083	0.069	0.11	0.047	0.099	0.057	0.124	0.07
Initial Average Quarterly Wage	953.913	938.11	895.988	1115.525	1348.744	1249.213	853.438	1480.28
Literacy Z-Score, Grade 11	-0.251	-0.189	0.067	-0.166	-0.55	0.06	0.106	-0.591
N (students)	541	7691	4641	418	899	1431	585	620

Outcomes by Concentration

	Agriculture, Food, and Natural Resources	Architecture and Construction	Arts, A/V Technology, and Communications	Business Management and Administration	Education and Training	Finance	Government and Public Administration	Health Sciences
Graduated High School	0.94	0.931	0.944	0.946	0.958	0.96	0.913	0.95
Initially Enroll, 2-Year College	0.154	0.107	0.246	0.179	0.198	0.235	0.117	0.378
Initially Enroll, 4-Year College	0.064	0.093	0.101	0.087	0.116	0.129	0.041	0.114
Initial Average Quarterly Wage	1128.575	1192.029	864.05	949.837	917.896	907.483	894.796	936.314

	Hospitality and Tourism	Human Services	Information Technology	Law, Public Safety, Corrections, and Security	Manufacturing	Marketing	Science, Technology, Engineering, and Mathematics	Transportation, Distribution, and Logistics
Graduated High School	0.943	0.912	0.921	0.917	0.912	0.9	0.932	0.92
Initially Enroll, 2-Year College	0.203	0.164	0.208	0.369	0.416	0.138	0.286	0.415
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