Analysis of Arkansas's Career and Technical Education (CTE) Programs

Office for Education Policy

Department of Education Reform

University of Arkansas

and

Insightful Education Solutions

July 2023

Overview

The University of Arkansas's Office for Education Policy (OEP) in collaboration with Insightful Education Solutions drafted this report to satisfy section 4.a from the Governor's LEARNS Executive Order.

Our analysis was limited by data availability, data definitions and collection, and other structural conditions of Arkansas's Career and Technical (CTE) program. We are collaborating with the state to address these challenges so that in future years we can provide an even more comprehensive picture.

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Insightful Education Solutions

High Quality CTE Pathways

High quality CTE pathways:

- Align with **high demand, high skill, and higher wage** (**H**^{3}) sectors and occupations,
- **Align vertically** with postsecondary credential programs,
- Reflect courses that are **sequential and progressive,**
- Possess course standards that are robust and **accurately represent the academic technical and employability knowledge and skills** learners must master,
- Incorporate courses and/or exams eligible for **early postsecondary credit,**
- Include opportunities to earn i**ndustry credentials** valued by employers, and
- Incorporate a continuum of **work-based learning.**

Note: These attributes are consistent the federal Perkins V federal grant definition as well as other examples of high quality CTE pathways in leading states and regions.

Our analysis focuses on K-12 CTE pathways.
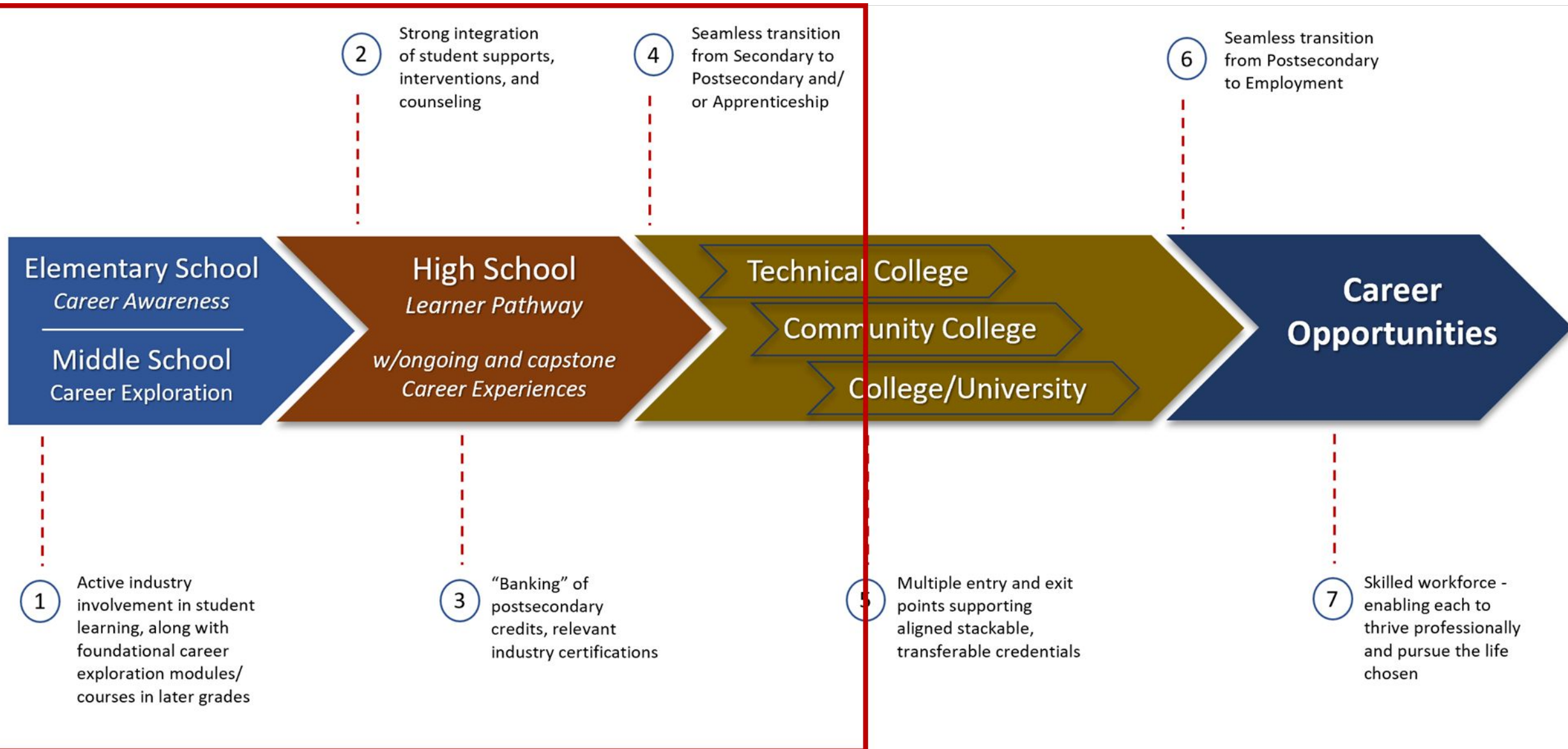
High quality CTE pathways allow learners to seamlessly transition through their education journey, earning aligned, stackable credentials?
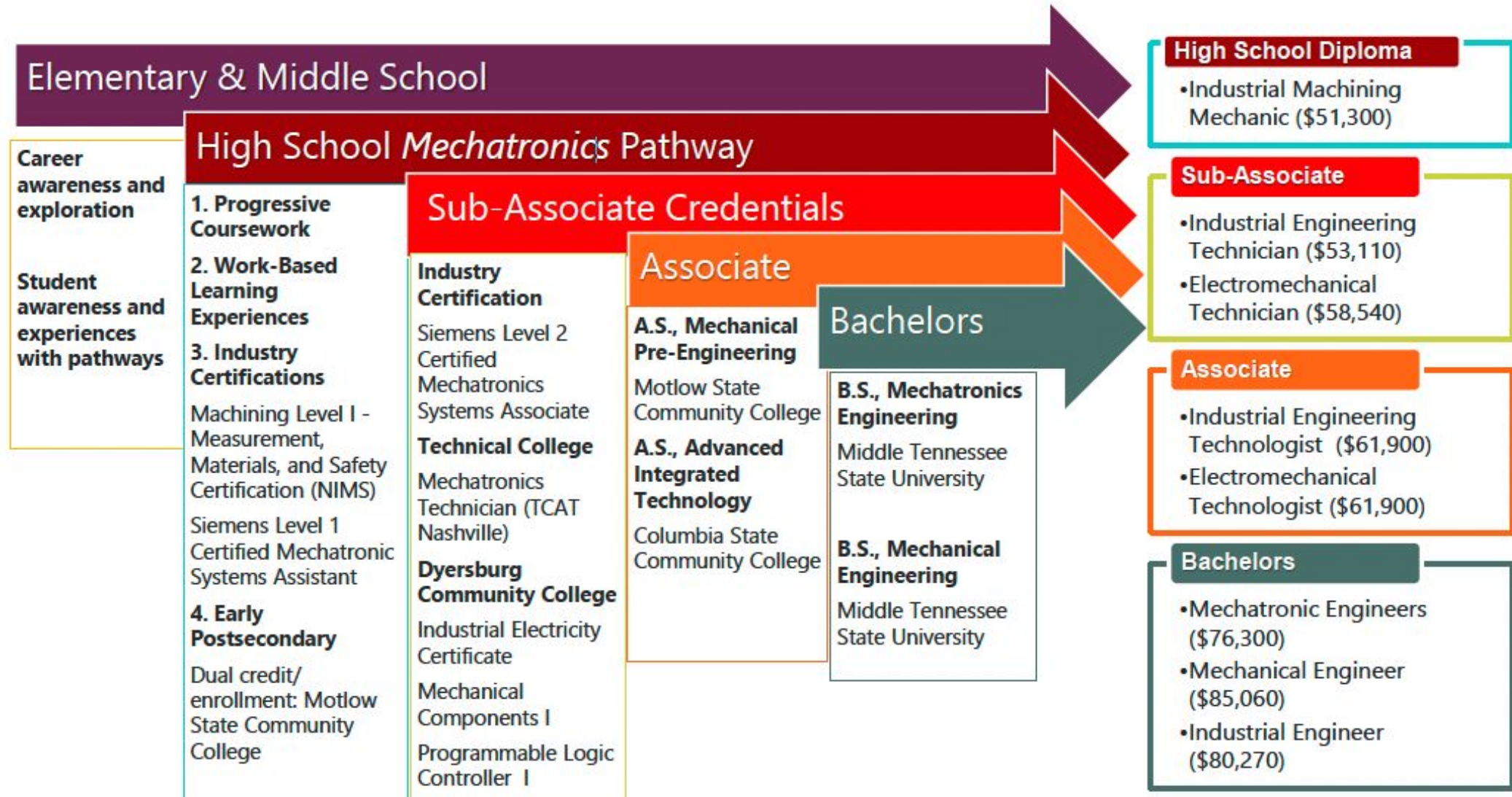
Note: Mechatronics/Advanced Manufacturing pathway adapted from Tennessee

Arkansas CTE Pathways

Key Terms and Definitions

Program of Study	A coordinated, non-duplicative sequence of academic and technical content at the secondary and postsecondary level that meets federal requirements outlined in Perkins V.
Completers	Students who have completed three (3) courses within a career cluster program of study.
Concentrators	Students who enroll in a minimum of two (2) units of credit in a CTE program area.
High-Quality Indicators	Earned industry-recognized credential or certification, earned early postsecondary credits, and postsecondary matriculation.
Earned Industry Certification	Graduates who were reported to have earned an industry-recognized credential prior to graduating high school.
Earned Early Postsecondary Credits	Graduates who earned any Advanced Placement, International Baccalaureate, Concurrent Credit (including CTE Concurrent Credit courses) credits prior to graduating high school.
Postsecondary Matriculation	Graduates who were reported to be enrolled in a postsecondary placement by DIS and ARData. Students may appear in multiple programs of study due to reporting methods.
H^3	High demand, high skill, and high wage occupations.

About the Data

The data was collected via collaboration with the Arkansas Department of Education's (ADE) Division of Career and Technical Education and Division of Elementary and Secondary Education and the University of Arkansas' Office of Innovation for Education and Office for Education Policy.

Source	Data Shared / Collaborated On
Division of Career and Technical Education	Labor market and Perkins V data; Work-Based Learning completion
Office of Innovation for Education	Programs of Study (POS) completion and high-quality indicator data; Program definitions
Division of Elementary and Secondary Education	Statewide enrollment and high-quality indicator data
Office for Education Policy	Stakeholder survey results

Analysis Limitations

1. The state was unable to provide access to linked, student-level data in time to complete a more comprehensive analysis, including detailed outcomes and return on investment calculations. Instead, this analysis relies on aggregate data which limits our ability to fully investigate the outcomes of CTE students.

2. Concentration data may be inflated due to current business rules for counting. Until 2022-23, all students who took a level 1 course and any other level 2 or 3 course would be counted as a concentrator, even if those courses were not in the same program of study. Therefore, this analysis focuses on completer/completion data to more accurately understand student outcomes related to CTE programs of study.

3. Industry certification data do not specify which certifications or how many certifications a student earned. These data are also only available for the 2021 and 2022 school years.

4. Postsecondary matriculation data were only available for 2020 and 2021 school years because we had to rely on aggregate data that had previously been linked for other purposes.

5. The state's current structure for organizing programs of study does not allow for easy analysis of directional alignment with high demand, high skill, high wage occupations. Therefore, this analysis focuses on the most completed programs of study.

CTE Pathway Quality

Analysis Questions - CTE Pathway Quality

- What are the top 10 CTE programs of study in terms of number of completers?
- To what extent are completers in these top 10 programs of study achieving high-quality indicators:
  - earning early postsecondary credit,
  - attaining at least one industry credential, <u>or</u>
  - matriculating to postsecondary education after high school?

Relatively few CTE completers earn a high quality indicator.

Total CTE Completions in Arkansas

- 2019 - 2020: 88,547
- 2020 - 2021: 78,415
- 2021 - 2022: 78,326
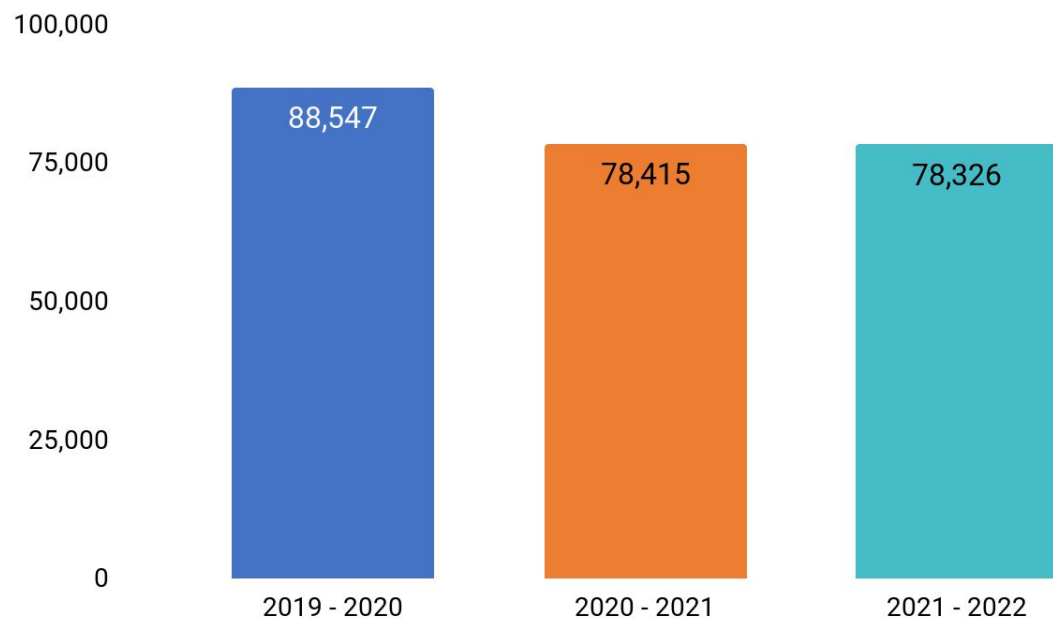
% Of Completions with High-Quality Indicator Earned

	Industry Credential	Early PS Credit	PS Matriculation
2019 - 2020		33%	27%
2020 - 2021	10%	32%	26%
2021 - 2022	29%	32%	
Last 3 Years	18%	33%	28%
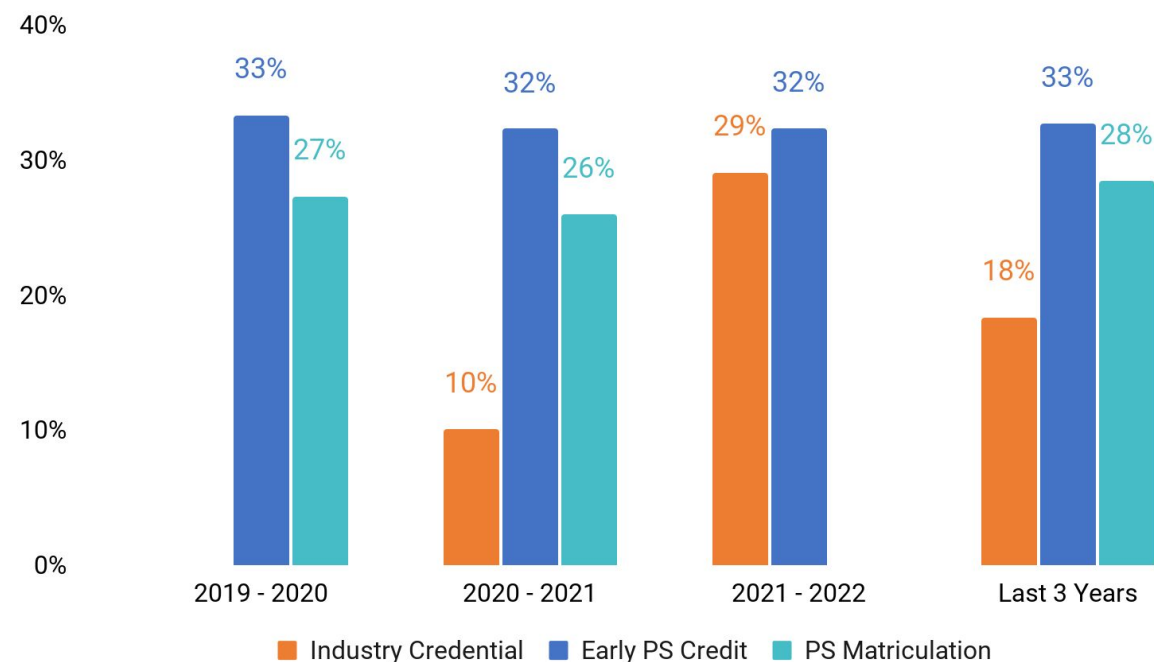
Note: Industry Credential data were not available for 2019-20.
Postsecondary (PS) Matriculation data were not available for 2021-2022.

Agriculture comprises half of the top ten programs of study.

Top 10 Programs of Study by
Completions in Arkansas (2020 -2022)

Program	2019-20	2020-21	2021-22	Total
Agribusiness Systems	12,026	9,963	10,058	32,047
Agricultural Power, Structural, & Technical Systems	7,297	6,856	7,131	21,284
Animal Systems	6,253	5,336	5,402	16,991
Office Administration	6,343	5,458	4,738	16,539
Plant Systems	5,611	4,895	4,950	15,456
Natural Resources/Environmental Service Systems	5,597	4,875	4,914	15,386
Advanced Nutrition and Dietetics	2,648	3,254	3,338	9,240
Family & Consumer Sciences - Family Studies	2,574	3,167	3,209	8,950
Family & Consumer Sciences - Entrepreneurial Design	2,574	3,167	3,209	8,950
Social Media and Communications	3,022	2,579	2,534	8,135

■ 2021-22 Completions ■ 2020-21 Completions ■ 2019-20 Completions

While Medical Professions are a critical occupational need in Arkansas, they rank 20th in terms of completions.

Programs of Study 11 - 20 by Completions in Arkansas (2020 -2022)
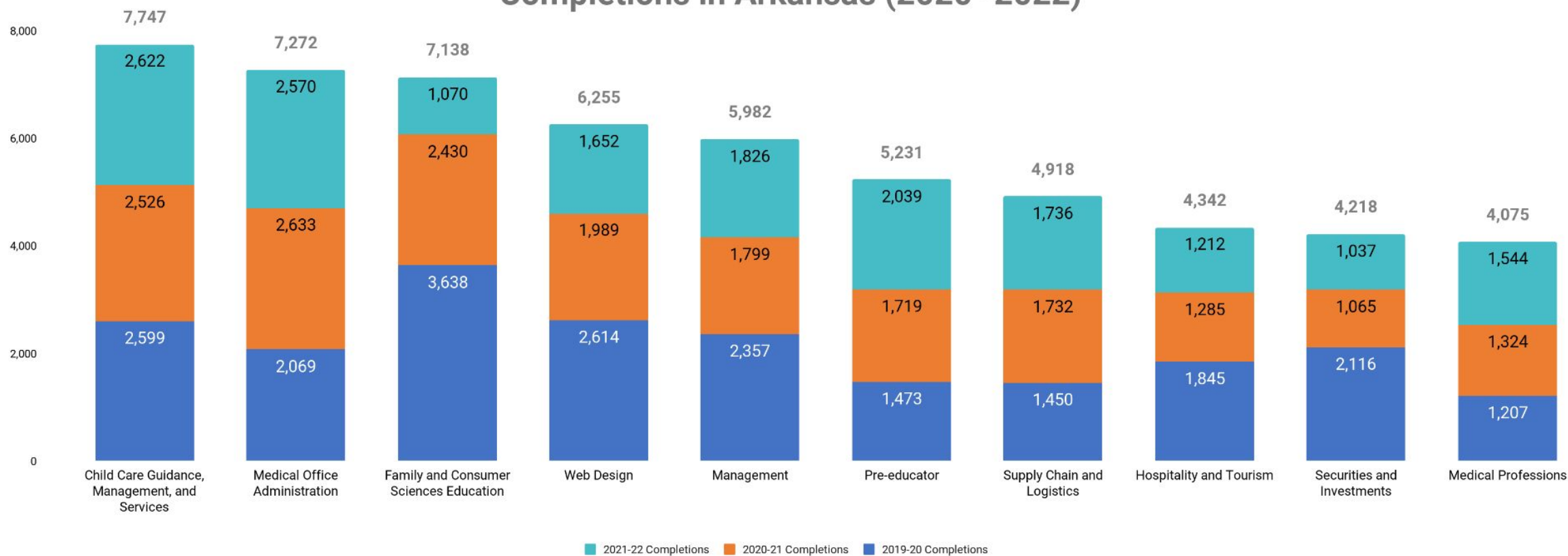
High-value programs of study such as Advanced Manufacturing, Engineering, and Pre-engineering have some of the lowest completion rates.

Programs of Study with lowest completion totals

2021-22 Completions 2020-21 Completions 2019-20 Completions
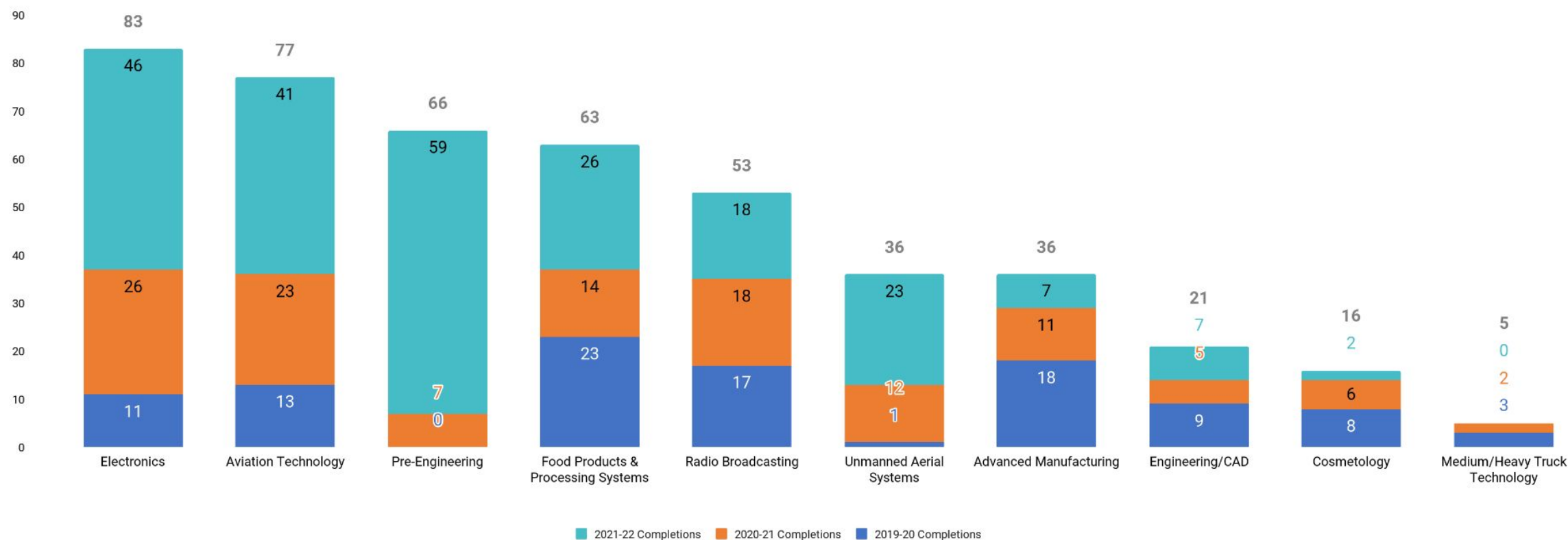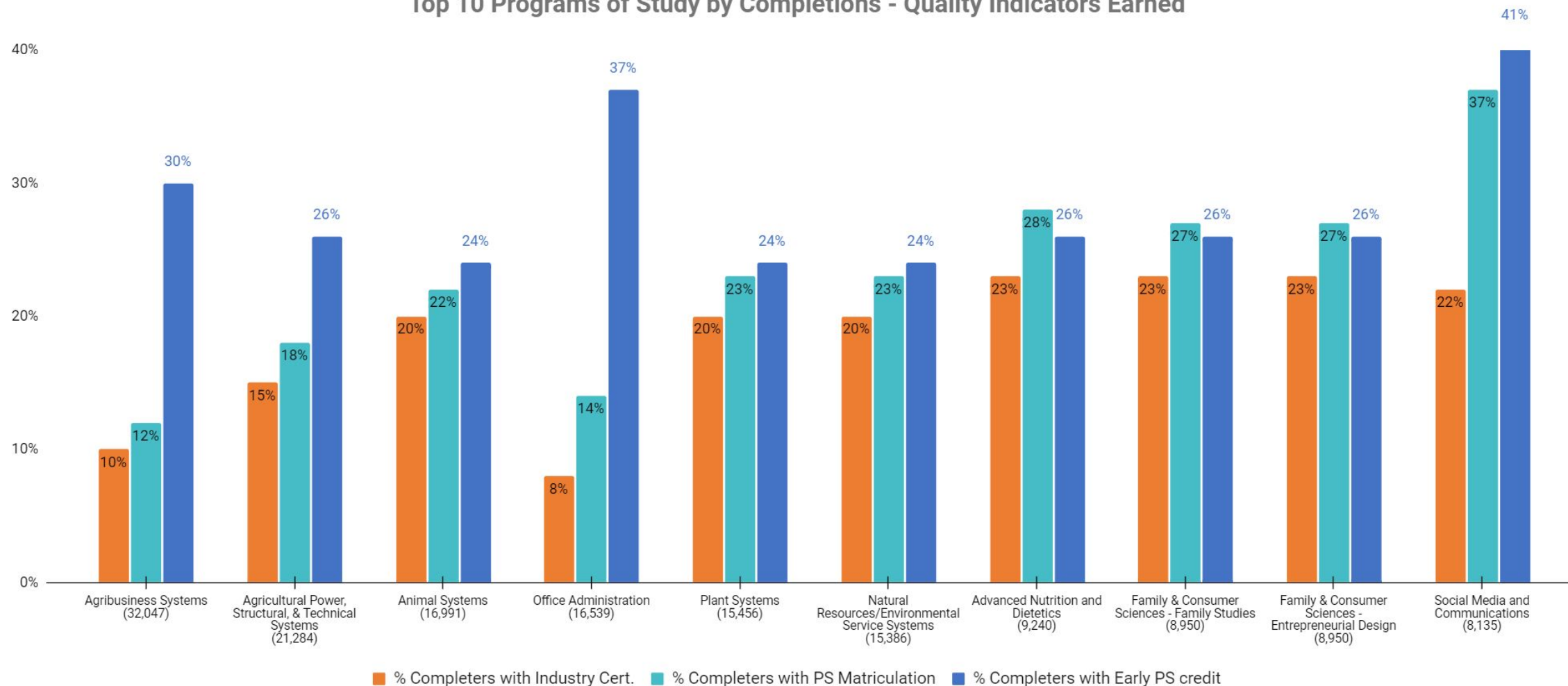
The most completed programs of study lag significantly behind other popular programs in high-quality indicator attainment.

Top 10 Programs of Study by Completions - Quality Indicators Earned

Legend:
- % Completers with Industry Cert.
- % Completers with PS Matriculation
- % Completers with Early PS credit

Program of Study	% Industry Cert.	% PS Matriculation	% Early PS credit
Agribusiness Systems (32,047)	10%	12%	30%
Agricultural Power, Structural, & Technical Systems (21,284)	15%	18%	26%
Animal Systems (16,991)	20%	22%	24%
Office Administration (16,539)	8%	14%	37%
Plant Systems (15,456)	20%	23%	24%
Natural Resources/Environmental Service Systems (15,386)	20%	23%	24%
Advanced Nutrition and Dietetics (9,240)	23%	28%	26%
Family & Consumer Sciences - Family Studies (8,950)	23%	27%	26%
Family & Consumer Sciences - Entrepreneurial Design (8,950)	23%	27%	26%
Social Media and Communications (8,135)	22%	37%	41%

Programs of study with the highest industry credential attainment rates have low completion rates.

Programs of Study with Highest % Industry Credential - Completers
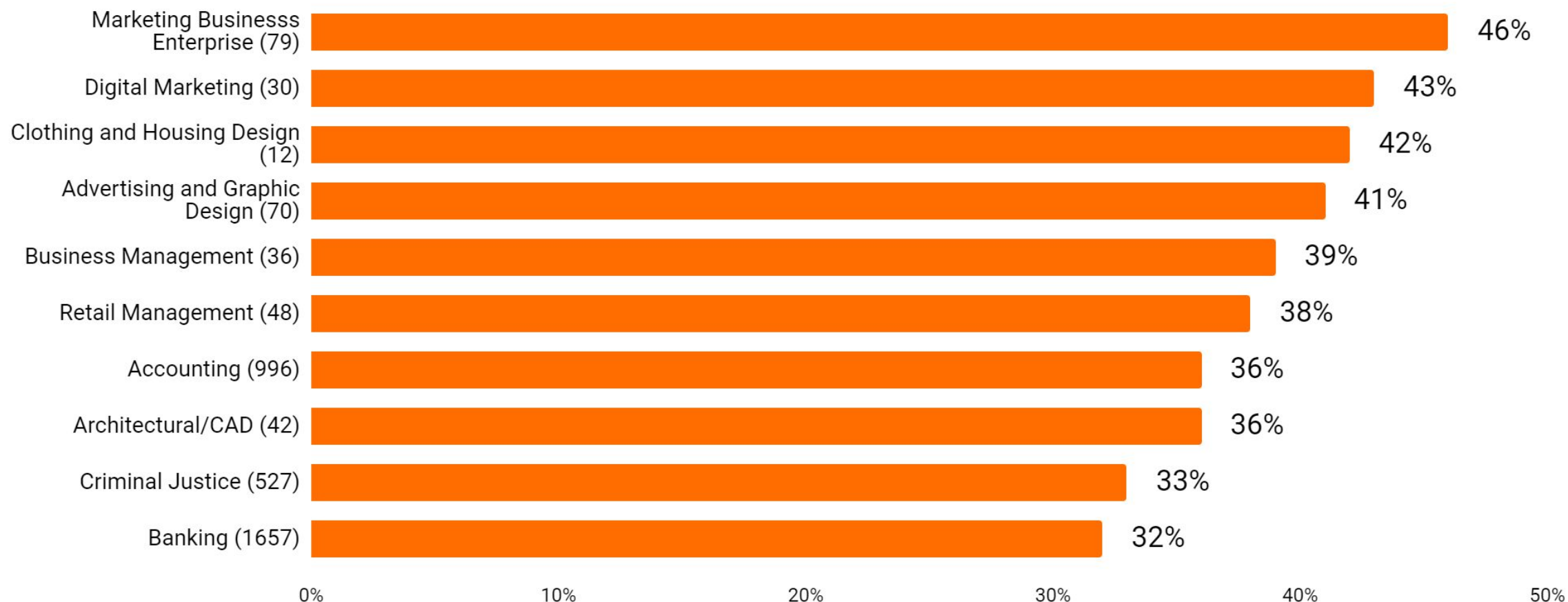
Program	Rate
Marketing Businesss Enterprise (79)	46%
Digital Marketing (30)	43%
Clothing and Housing Design (12)	42%
Advertising and Graphic Design (70)	41%
Business Management (36)	39%
Retail Management (48)	38%
Accounting (996)	36%
Architectural/CAD (42)	36%
Criminal Justice (527)	33%
Banking (1657)	32%

Note: The values in parentheses are the total reported completers in that program of study in the years in which industry credential data was available, 2021 and 2022. POS with less than 10 completers were excluded.

None of the top 10 programs of study by completion appear in the top 10 with the highest percentage of early postsecondary credit.
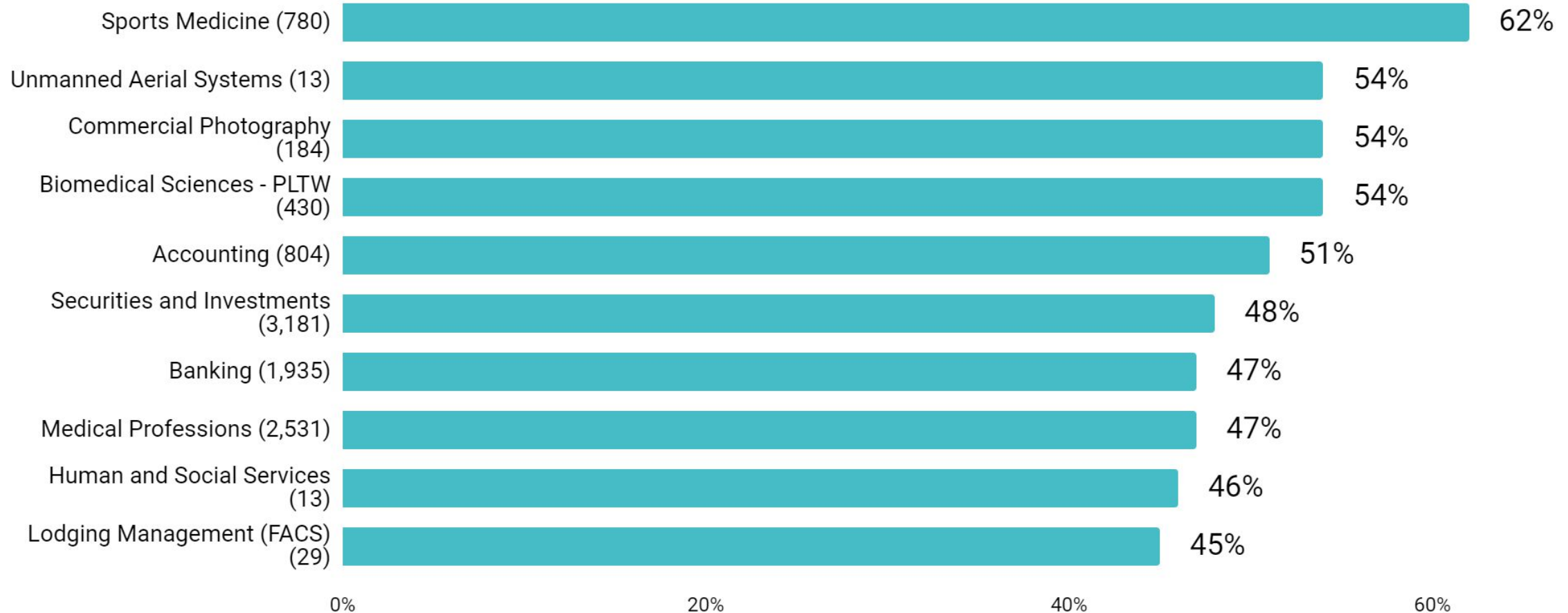

Programs of Study with Highest % early PS Credit - Completers

Program of Study	Percentage
Commercial Photography (268)	67%
Computer Science: Mobile Applications Development (20)	65%
Computer Science: Robotics (34)	65%
Biomedical Sciences - PLTW (581)	63%
Pre-Engineering (66)	61%
Engineering/CAD (21)	57%
Computer Science: Cybersecurity (21)	57%
Sports Medicine (1296)	55%
Medical Professions (4075)	54%
Insurance and Risk Management (3691)	53%
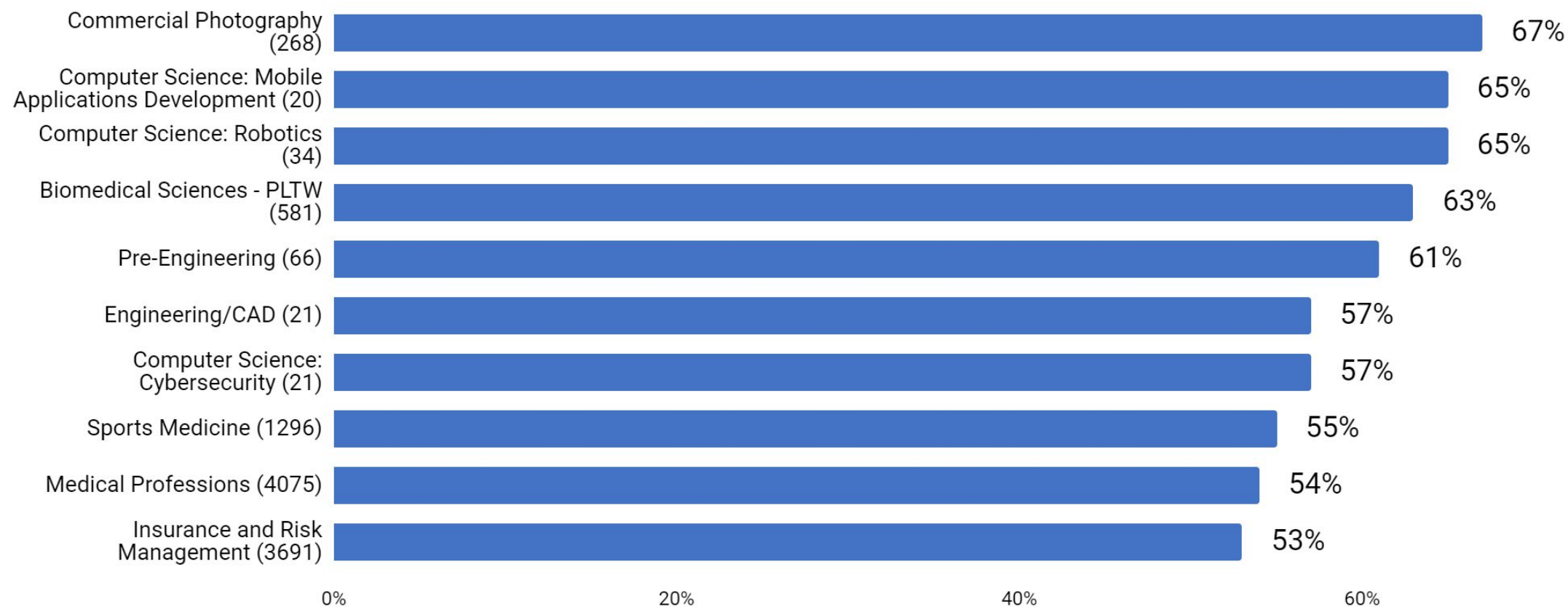
Note: The values in parentheses are the total reported completers in that program of study over the last three years. POS with less than 10 completers were excluded.

None of the top 10 programs of study by completion appear in the top 10 with the highest percentage of postsecondary matriculation.

Programs of Study with Highest % PS Matriculation - Completers

Program	%
Sports Medicine (780)	62%
Unmanned Aerial Systems (13)	54%
Commercial Photography (184)	54%
Biomedical Sciences - PLTW (430)	54%
Accounting (804)	51%
Securities and Investments (3,181)	48%
Banking (1,935)	47%
Medical Professions (2,531)	47%
Human and Social Services (13)	46%
Lodging Management (FACS) (29)	45%

Note: The values in parentheses are the total reported completers in that program of study in the years in which matriculation data was available, 2020 and 2021. POS with less than 10 completers were excluded.

CTE Pathway Alignment

Analysis Questions - CTE Pathway Alignment

- What are the top industry sectors and occupations in Arkansas?
- How well do the CTE program completion rates align with industry sector and occupational demand?
- Do trends in CTE program completion reflect any difference in alignment with H^3 industry sector and occupational demand over time?

Employment by Sector and Statewide Priority Sectors

Arkansas Employment Distribution - 2021

Trade, Transportation & Utilities	21%
Government	14%
Education & Health Services	15%
Manufacturing	13%
Professional & Business Services	12%
Leisure & Hospitality	10%
Construction	5%
Financial Activities	4%
Natural Resources & Mining	1%
Other Services	2%
Information	1%

Source: Arkansas Covered Employment & Earnings
(2021 - most recent)

Arkansas Priority Sectors - 2022

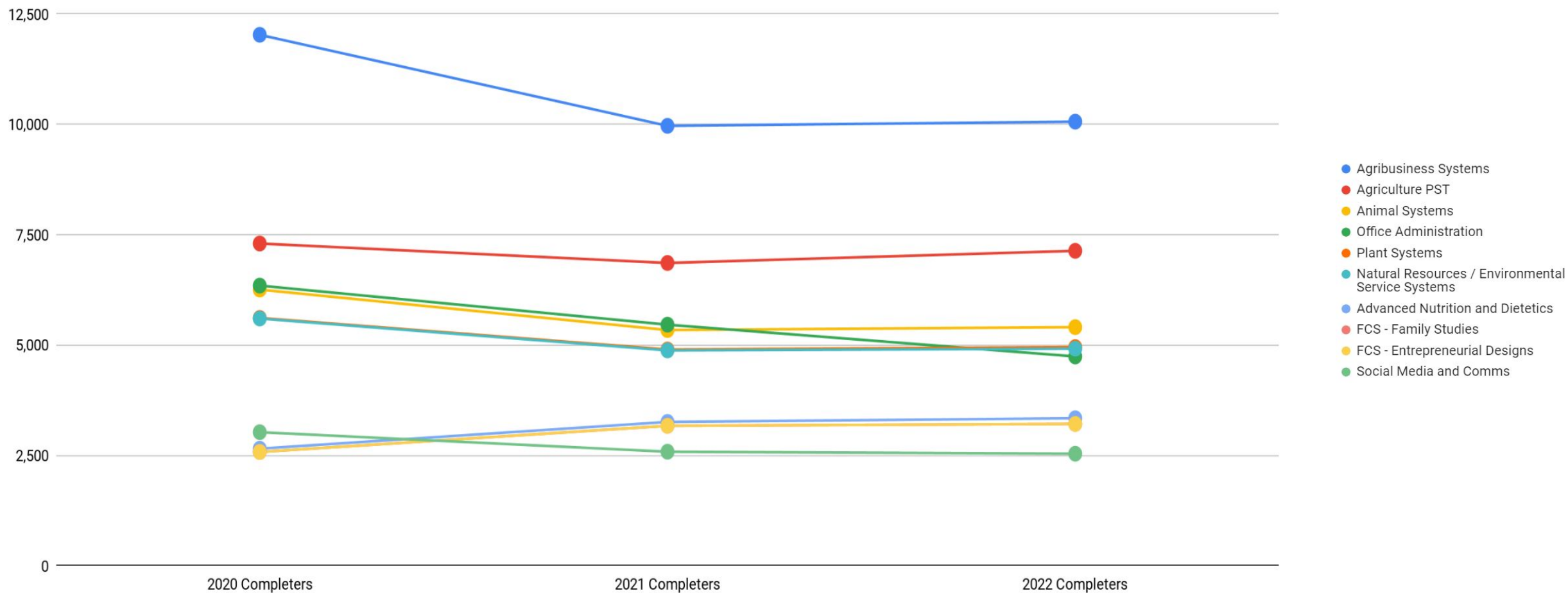| Sector	Description
Aerospace and Defense	*Aerospace and aviation represents Arkansas' #1 export, and the state is home to nearly 170 aerospace and defense companies that include MRO, component parts, completion centers, and defense contractors, as well as the Little Rock AFB.*
Corporate and Shared Services	*Arkansas is home to the world's largest retailer and seven other companies on Fortune magazine's list of the largest 1,000 companies in the United States. The state is home to corporate leaders in retail, transportation, and food processing.*
Distribution and Logistics	*The state has a growing distribution and logistics services sector. Arkansas is home to more than 6,800 transportation, logistics, and distribution companies.*
Firearms and Ammunition	*Promotion of manufacturers and businesses involved in sales and distribution of firearms and ammunition.*
Food and Beverage	*Home to one of the world's largest food companies and some of the top food manufacturing in the industry. The state also produces 49% of all rice in the U.S.*
Metals	*The metals industry accounts for 13.6% of total manufacturing. The state boasts the second-largest capacity for steel production in the nation.*
Technology	*State is focused on attracting high-tech companies across various industry sectors. (This is a high priority growth sector for the state.)*
Timber and Forest Products	*Since 1978, Arkansas has increased its forest area by 5%, and its amount of standing timber by 50%. Every year, the state is growing 15+ million tons of wood fiber over and above what is being harvested.*
Transportation Equipment	*Closely tied to transportation companies supporting the state's focus on distribution and logistics, the manufacturing of equipment to support the transportation of goods and services is a growing sector.*

Source: Arkansas Economic Development Commission

There is very little alignment between Arkansas's top 10 occupations, H³ occupations, and CTE programs of study.

Top 10 Occupations/Industry Sectors (Statewide – 2022, Q4)	Top 10 H³ Occupations * (Statewide – 2022, Q4)	Top 10 High School CTE Programs of Study (Statewide)
Laborers and Material Movers *Transportation and Material Moving (53-0000)*	**K-12 Educators** *Educational Instruction and Library (25-0000)*	Agribusiness Systems
Drivers and Truck Drivers *Transportation and Material Moving (53-0000)*	**Registered Nurses** *Healthcare Practitioners and Technical (29-0000)*	Agricultural Power, Structural and Technical
Retail Salespersons *Sales and Related (41-0000)*	**General & Operations Managers** *Management (11-0000)*	Animal Systems
Fast Food and Counter Workers *Food Preparation/Serving Related (35-0000)*	**Sales Reps, Wholesale & Manufacturing** *Sales/Related (41-0000)*	Office Administration
Cashiers *Sales and Related (41-0000)*	**First-Line Supervisors** *Office and Administrative Support (43-0000)*	Plant Systems
Registered Nurses *Healthcare Practitioners and Technical (29-0000)*	**Software, Web Developers, Programmers** *Computer & Mathematic (15-0000)*	Natural Resources/Environmental Services
General and Operations Managers *Management (11-0000)*	**Accountants & Auditors** *Business and Financial Operations (13-0000)*	Advanced Nutrition and Dietetics
Building Cleaning Workers *Building, Grounds Cleaning & Maintenance (37-0000)*	**Business Operations Specialists** *Business and Financial Operations (13-0000)*	Family & Consumer Sciences – Family Studies
Cooks *Food Preparation and Serving Related (35-0000)*	**Logisticians & Project Mgmt Specialists** *Business and Financial Operations (13-0000)*	Family & Consumer Sciences – Entrepreneurial Design
Office Clerks, General *Office and Administrative Support (43-0000)*	**Therapists** *Healthcare Practitioners and Technical (29-0000)*	Social Media and Communications

Key:
Blue = Links between Top 10 Occupations and Top 10 H³ Occupations

Tan = Links between Top 10 H³ Occupations and Top 10 CTE Programs of Study

* H³ occupations are those careers that reflect high-skill, high-wage, and high-demand

Completer patterns have not changed substantially over time or in ways that might improve alignment.

Arkansas CTE Programs of Study by Completer, by Year

Legend:
- Agribusiness Systems
- Agriculture PST
- Animal Systems
- Office Administration
- Plant Systems
- Natural Resources / Environmental Service Systems
- Advanced Nutrition and Dietetics
- FCS - Family Studies
- FCS - Entrepreneurial Designs
- Social Media and Comms

X-axis: 2020 Completers, 2021 Completers, 2022 Completers

* ADE was unable to differentiate completer counts due to "cross-listed course numbers."

None of the Top 10 programs reflect (a) STEM-related industry sectors or occupations (e.g., healthcare, engineering, information technology, etc.) or (b) occupations in the Advanced Manufacturing industry sector.

Top 10 CTE Programs of Study by Completers

Program of Study	2020 Completers	2021 Completers	2022 Completers
Agribusiness Systems	12,026	9,963	10,058
Agriculture PST	7,297	6,856	7,131
Animal Systems	6,253	5,336	5,402
Office Administration	6,343	5,458	4,738
Plant Systems	5,611	4,895	4,950
Natural Resources / Environmental Service Systems	5,597	4,875	4,914
Advanced Nutrition and Dietetics	2,648	3,254	3,338
FCS - Family Studies*	2,574	3,167	3,209
FCS - Entrepreneurial Designs*	2,574	3,167	3,209
Social Media and Comms	3,022	2,579	2,534

* ADE was unable to differentiate completer counts due to "cross-listed course numbers."\
** Green indicates an increase in completers from the previous year while red indicates a decrease.

While some of the top 11-20 programs are STEM-related, they are much smaller than the Agriculture programs that make up the top 3.

Top 3 CTE Programs of Study Compared to Programs 11-20 by Completers

Program of Study	2020 Completers	2021 Completers	2022 Completers
Agribusiness Systems	12,026	9,963	10,058
Agriculture PST	7,297	6,856	7,131
Animal Systems	6,253	5,336	5,402
Child Care	2,599	2,526	2,622
Medical Office	2,069	2,633	2,570
FCS - Education	3,638	2,430	1,070
Web Design	2,614	1,989	1,652
Management	2,357	1,799	1,826
Pre-Educator	1,473	1,719	2,039
Supply Chain and Logistics	1,450	1,732	1,736
Hospitality and Tourism	1,845	1,285	1,212
Securities and Investments	2,116	1,065	1,037
Medical Professions	1,207	1,324	1,544

** Green indicates an increase in completers from the previous year while red indicates a decrease.

CTE Leader Survey

To better understand whether Arkansas CTE programs meet the needs of the current workforce, we conducted a survey of CTE leaders in the spring of 2023. The survey aimed to understand perceptions, successes, and challenges of current CTE programs. The survey was electronically administered to CTE coordinators, principals/administrators, and district superintendents.

This report presents the key survey results.

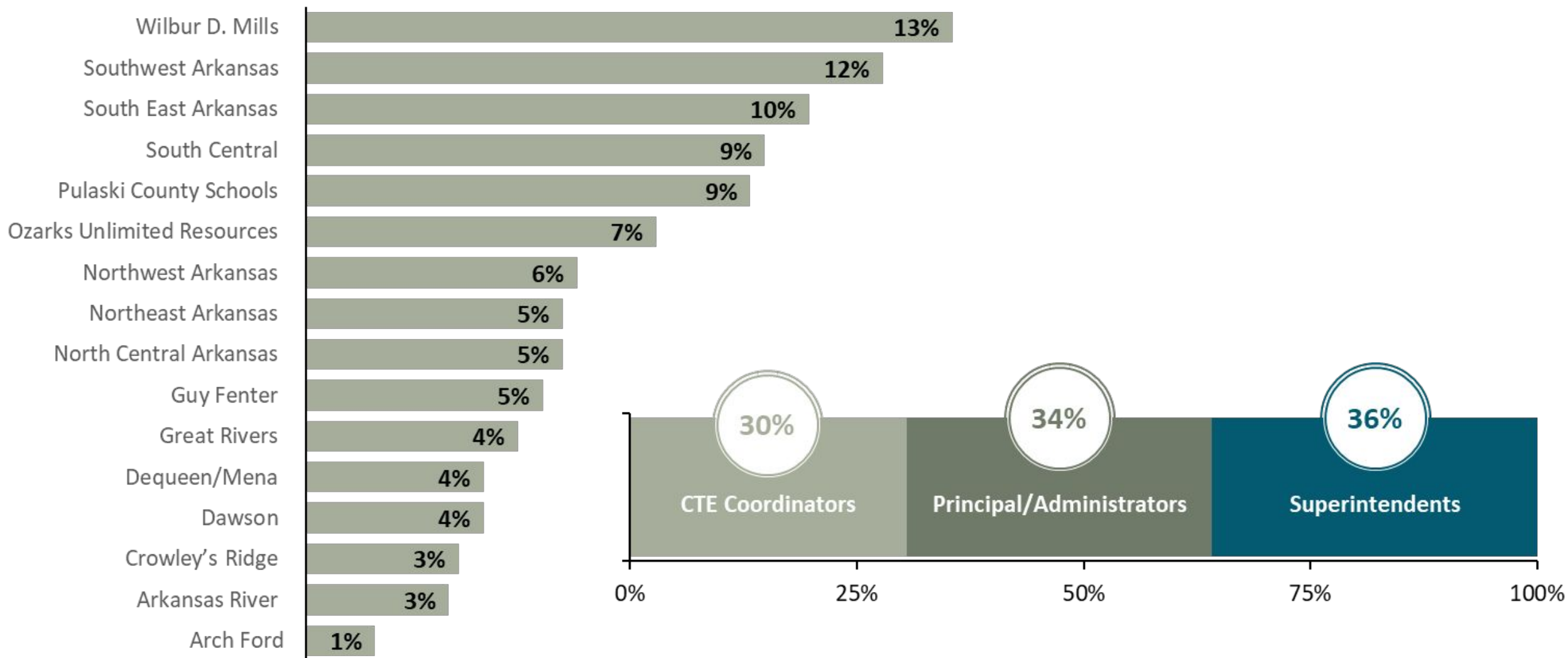For a comprehensive breakdown by CTE role and educational cooperatives, **click here**.

Key Findings:

Of the respondents…

- 82% ranked students completing **general education courses** as the most important for demonstrating student readiness post high-school.

- 26% noted that **CTE is more important than general education courses.**

- 25% noted that **connecting academic learning to real-world skills is more important than meeting college entrance requirements.**

- CTE Coordinators noted having **less influence** over CTE decision making such as deciding whether to offer pathways or offering work-based learning opportunities.

- The top three strengths and challenges for CTE stakeholders are:

  1. Aligning CTE pathways with high-skill, high-demand, and high-wage occupations,
  2. Finding and hiring teachers with advanced technical knowledge, and
  3. Having access to sustainable funding.

Response Rate

We received **427 completed surveys** from CTE coordinators, principals/administrators, and superintendents from all educational cooperatives across the state of Arkansas

Cooperative	Response Rate
Wilbur D. Mills	13%
Southwest Arkansas	12%
South East Arkansas	10%
South Central	9%
Pulaski County Schools	9%
Ozarks Unlimited Resources	7%
Northwest Arkansas	6%
Northeast Arkansas	5%
North Central Arkansas	5%
Guy Fenter	5%
Great Rivers	4%
Dequeen/Mena	4%
Dawson	4%
Crowley's Ridge	3%
Arkansas River	3%
Arch Ford	1%

30% CTE Coordinators
34% Principal/Administrators
36% Superintendents

0%   25%   50%   75%   100%

What is most important for demonstrating student readiness for life after high school?

Top Response #1	Top Response #2	Top Response #3
82%	**75%**	**37%**
Complete required general education course (e.g., English, math, science, etc.)	Demonstrate skills employers value (e.g., teamwork, problem-solving, etc.)	Participate in work-based experiences (e.g., job shadowing, internships, workplace tours, etc.)

The above results represents the percentage of participants who ranked the responses in their top three most important. The top two responses are the same for CTE coordinators, administrators, and superintendents.

However, 37% of CTE coordinators identified **earning industry-valued certification while in high school** as the third most important for demonstrating student readiness for life after high school.

What is most important for demonstrating student readiness for life after high school?
Responses by Role

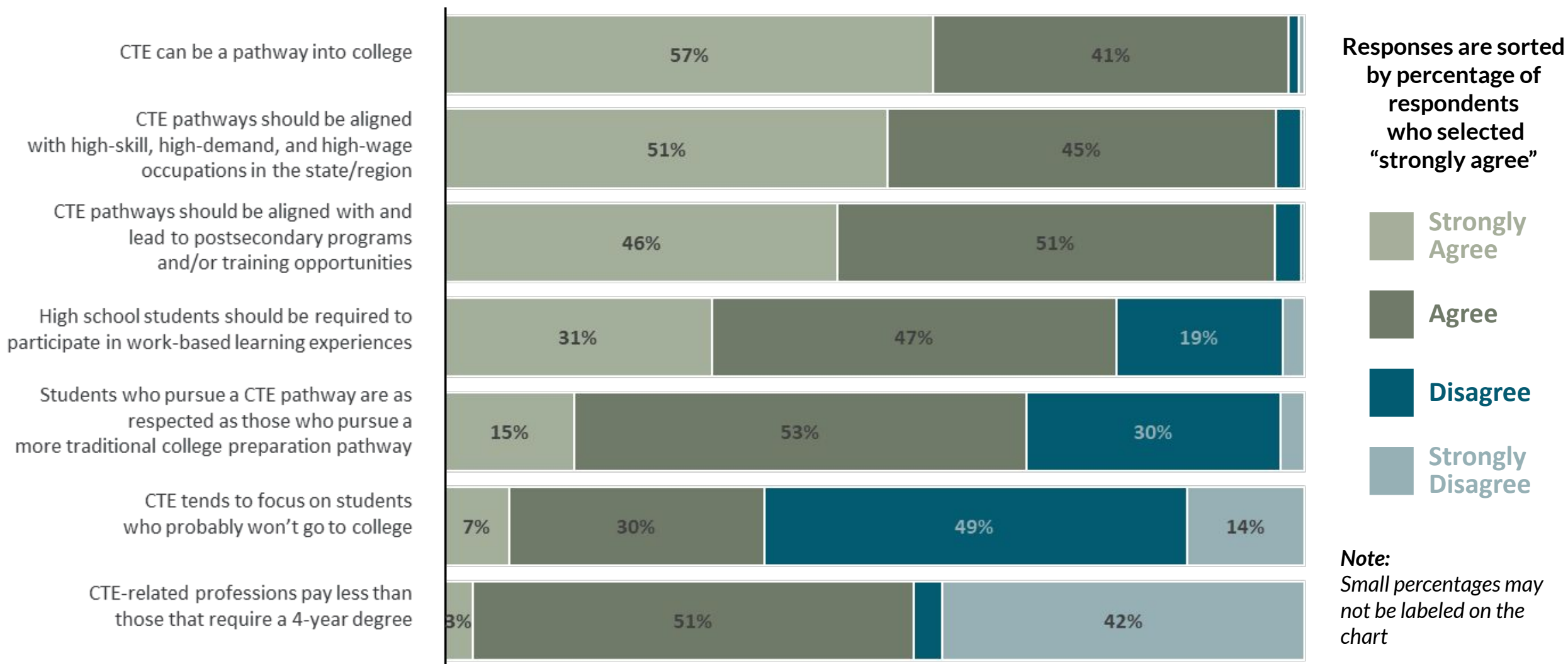*Percent of respondents who selected "strongly agree" or "agree"*

Key:

Higher percentage than overall	Same percentage as overall	Lower percentage than overall

	Overall	CTE Coordinators	Principals/ Administrators	Superintendents
Complete required general education courses (e.g., English, math, science, etc.).	82%	82%	82%	82%
Complete a CTE pathway.	35%	37%	34%	33%
Demonstrate skills employers value (e.g., teamwork, problem-solving, etc.).	75%	80%	72%	74%
Earn college credit while in high school.	18%	10%	22%	23%
Earn industry-valued certifications while in high school	31%	37%	26%	34%
Participate in work-based experiences (e.g., job shadowing, internships, workplace tours, etc.)	37%	37%	39%	34%
Meet college entrance requirements.	22%	17%	26%	23%

To what extent do you agree or disagree with each of the following statements?

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
CTE can be a pathway into college	57%	41%		
CTE pathways should be aligned with high-skill, high-demand, and high-wage occupations in the state/region	51%	45%		
CTE pathways should be aligned with and lead to postsecondary programs and/or training opportunities	46%	51%		
High school students should be required to participate in work-based learning experiences	31%	47%	19%	
Students who pursue a CTE pathway are as respected as those who pursue a more traditional college preparation pathway	15%	53%	30%	
CTE tends to focus on students who probably won't go to college	7%	30%	49%	14%
CTE-related professions pay less than those that require a 4-year degree	3%	51%		42%

Responses are sorted by percentage of respondents who selected "strongly agree"

Strongly Agree

Agree

Disagree

Strongly Disagree

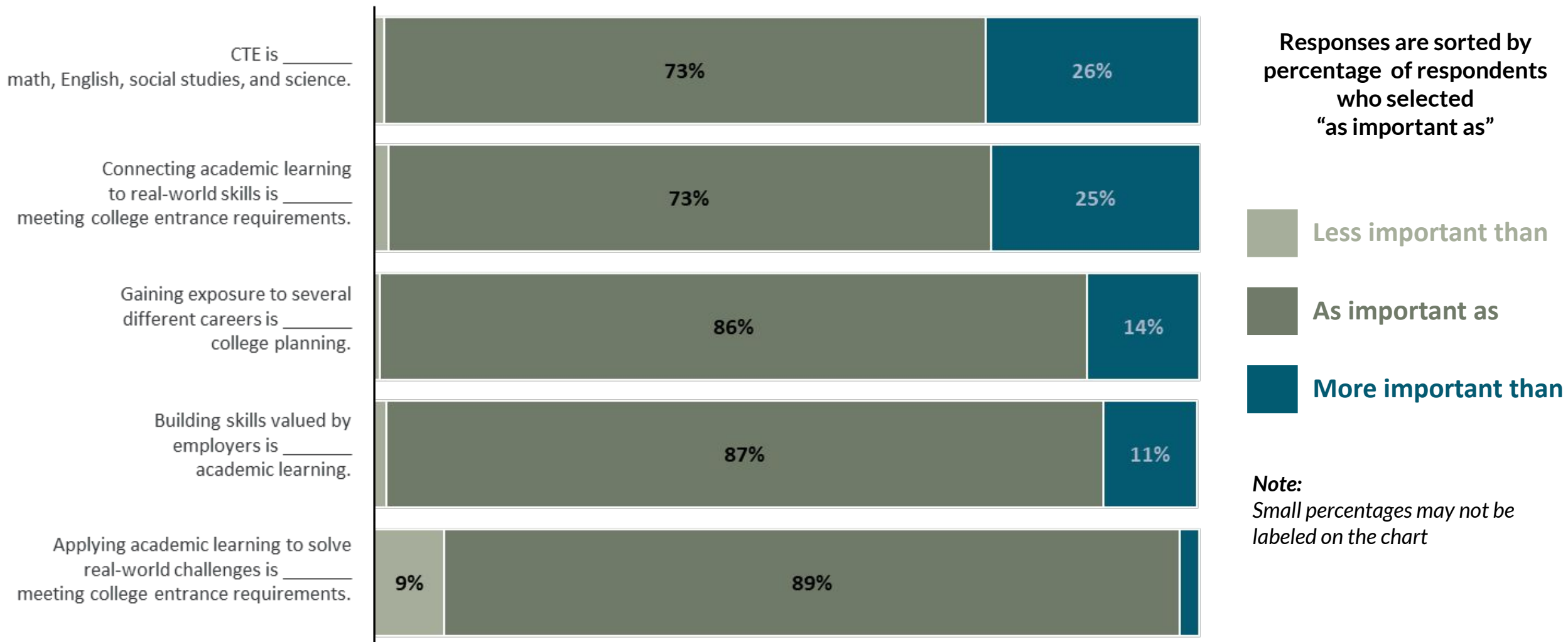*Note: Small percentages may not be labeled on the chart*

To what extent do you agree or disagree with each of the following statements?
Responses by Role

Percent of respondents who selected "strongly agree" or "agree"

	Overall	CTE Coordinators	Principals/ Administrators	Superintendents
CTE can be a pathway into college	98%	98%	99%	97%
CTE tends to focus on students who probably won't go to college.	37%	29%	36%	45%
CTE-related professions pay less than those that require a 4-year degree.	6%	5%	8%	5%
Students who pursue a CTE pathway are as respected as those who pursue a more traditional college preparation pathway	68%	64%	79%	59%
CTE pathways should be aligned with high-skill, high-demand, and high-wage occupations in the state/region.	97%	94%	99%	97%
CTE pathways should be aligned with and lead to postsecondary programs and/or training opportunities.	96%	96%	96%	97%
High school students should be required to participate in work-based learning experiences (e.g., job shadowing, internships, workplace tours, etc.)	78%	78%	76%	80%

Indicate the relative importance of the following aspects of high school education.

CTE is _____ math, English, social studies, and science.
73% | **26%**

Connecting academic learning to real-world skills is _____ meeting college entrance requirements.
73% | **25%**

Gaining exposure to several different careers is _____ college planning.
86% | **14%**

Building skills valued by employers is _____ academic learning.
87% | **11%**

Applying academic learning to solve real-world challenges is _____ meeting college entrance requirements.
9% | **89%**

Responses are sorted by percentage of respondents who selected "as important as"

Less important than

As important as

More important than

Note:
Small percentages may not be labeled on the chart

Indicate the relative importance of the following aspects of high school education.
Responses by Role

Percent of respondents who selected "as important as" or "more important than"

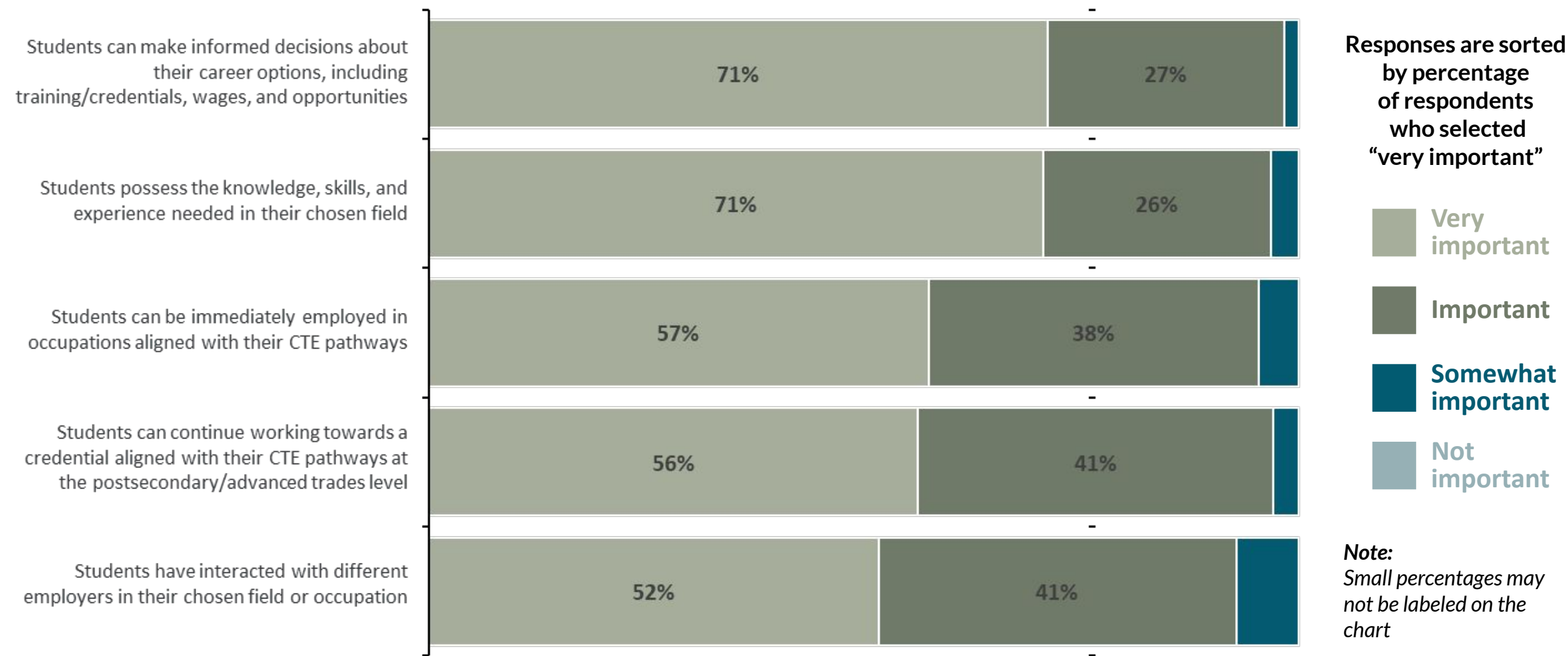|	Overall	CTE Coordinators	Principals/ Administrators	Superintendents
CTE is _____ math, English, social studies and science	89%	88%	90%	89%
Connecting academic learning to real-world skills is _____ meeting college entrance requirements.	73%	67%	79%	72%
Gaining exposure to several different careers is _____ college planning.	86%	78%	87%	91%
Building skills valued by employers is _____ academic learning.	87%	80%	90%	91%
Applying academic learning to solve real-world challenges is _____ meeting college entrance requirements.	73%	66%	78%	75%

Key:

Higher percentage than overall	Same percentage as overall	Lower percentage than overall

How important are the following outcomes for students participating in a CTE pathway?

Responses are sorted by percentage of respondents who selected "very important"

- **Very important**
- **Important**
- **Somewhat important**
- **Not important**

Note: Small percentages may not be labeled on the chart

Students can make informed decisions about their career options, including training/credentials, wages, and opportunities — 71% | 27%

Students possess the knowledge, skills, and experience needed in their chosen field — 71% | 26%

Students can be immediately employed in occupations aligned with their CTE pathways — 57% | 38%

Students can continue working towards a credential aligned with their CTE pathways at the postsecondary/advanced trades level — 56% | 41%

Students have interacted with different employers in their chosen field or occupation — 52% | 41%

How important are the following outcomes for students participating in a CTE pathway?
Responses by Role

Percent of respondents who selected "very important" or "important"

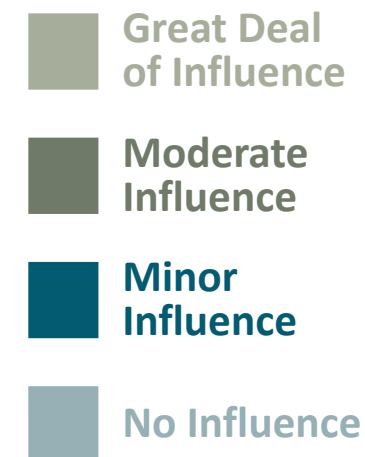|	Overall	CTE Coordinators	Principals/ Administrators	Superintendents
Students possess the knowledge, skills, and experience needed in their chosen field or occupation.	97%	98%	98%	95%
Students can be immediately employed in occupations aligned with their CTE pathways.	95%	96%	94%	96%
Students can continue working towards a credential aligned with their CTE pathways at the postsecondary/advanced trades level.	97%	98%	98%	95%
Students can make informed decisions about their career options, including needed training/credentials, wages, and employment opportunities.	98%	98%	99%	99%
Students have interacted with different employers in their chosen field or occupation.	93%	91%	95%	93%

Key:

Higher percentage than overall	Same percentage as overall	Lower percentage than overall

In your role at your school or district, how much influence do you have in the following areas?

Area	Great Deal of Influence	Moderate Influence	Minor Influence	No Influence
Deciding whether to offer or change a CTE pathway	59%	31%	8%	
Hiring teachers who can effectively teach CTE courses	58%	27%	9%	6%
Purchasing or securing access to equipment and supplies needed to offer a CTE pathway.	47%	32%	18%	
Ensuring that CTE students have the opportunity to pursue relevant college credit courses in high school.	39%	39%	18%	
Identifying and engaging with local or regional employers aligned with our CTE pathways.	37%	44%	14%	4%
Ensuring that CTE pathways are aligned with high-skill, high-demand, and high-wage occupations.	34%	42%	19%	5%
Ensuring CTE students earn industry credentials that employers value.	32%	43%	19%	4%
Offering work-based learning opportunities.	30%	41%	23%	7%

Responses are sorted by percentage of respondents who selected "great deal of influence"

Note:
Small percentages may not be labeled on the chart

In your role at your school or district, how much influence do you have in the following areas?
Responses by Role

Percent of respondents who selected "great deal of influence" or "moderate influence"

	Overall	CTE Coordinators	Principals/ Administrators	Superintendents
Deciding whether to offer or change a CTE pathway.	90%	86%	87%	95%
Hiring teachers who can effectively teach CTE courses	85%	68%	92%	92%
Identifying and engaging with local or regional employers aligned with our CTE pathways.	82%	73%	80%	90%
Purchasing or securing access to equipment and supplies needed to offer a CTE pathway.	78%	76%	70%	89%
Ensuring that CTE pathways are aligned with high-skill, high-demand, and high-wage occupations.	76%	70%	80%	78%
Ensuring CTE students earn industry credentials that employers value.	76%	75%	78%	75%
Ensuring that CTE students have the opportunity to pursue relevant college credit courses in high school.	78%	65%	85%	83%
Offering work-based learning opportunities.	70%	59%	73%	77%

When considering the high school CTE learner pathways in your district or school, rank your top three strengths and challenges.

Top Strength #1	Top Strength #2	Top Strength #3
70%	**51%**	**45%**
Aligning CTE pathways with high skill, high-demand, and high-wage occupations in our region/state	Finding and/or hiring teachers with the advanced technical knowledge and skill to teach CTE courses	Having Access to sustainable funding that can support high-priority CTE pathways

Top Challenge #1	Top Challenge #2	Top Challenge #3
61%	**61%**	**53%**
Aligning CTE pathways with high skill, high-demand, and high-wage occupations in our region/state	Finding and/or hiring teachers with the advanced technical knowledge and skill to teach CTE courses	Having Access to sustainable funding that can support high-priority CTE pathways

Outcomes Measurement and Return on Investment (ROI)

Analysis Questions - Outcomes and ROI

Over the coming year, we plan to conduct a detailed analysis of CTE student outcomes and return on investment using linked, individual-level data.

Our analysis will replicate and build on the following 2016 report that analyzed Arkansas CTE student outcomes:
- Career and Technical Education in High School: Does It Improve Student Outcomes?

Our research questions include:
- Do Arkansas students who participate in CTE achieve better outcomes than similar students who don't participate in CTE?
- What is the return on investment for the state/districts from their investment in CTE programs?

Overview and Terms:

High-quality Career and Technical Education (CTE) programs strive to equip students with skills to prepare them for successful careers in a modern, competitive global economy.

Exposure to CTE programs should improve students' educational and employment outcomes.

CTE Concentrator	Students who enroll in a minimum of two (2) units of credit in a CTE program area.
CTE Completer	A CTE completer is a student who has completed three (3) courses within a career cluster.
High-wage	Average hourly wage greater than the Arkansas median wage.
High-Skill	Occupations that require an industry-credential of value, postsecondary training, apprenticeship, or degree.
High-Demand	A high-priority industry sector that has a substantial current or potential future impact on the state economy.

Outcome Measures

- **High School Graduation:** Proportion of students who met or exceeded the state's graduation requirements.

- **Postsecondary Matriculation:** Proportion of students enrolling in postsecondary education during the fall semester following high school graduation.

- **Postsecondary Completion:** 100 percent and 150 percent postsecondary completion rates and credential attainment rates.

- **Employment:**
  - Arkansas employment rate measured 1, 3, and 5 years after high school or postsecondary completion.
  - **High-Skill Employment:** Employment rate in occupations that require an industry-credential of value, postsecondary training, apprenticeship, or degree.
  - **High-Demand Occupation:** Employment rate in priority industry sectors that have a substantial current or potential future impact on the state economy.

- **Compensation:**
  - Average, median, and distribution of wages measured 1, 3, and 5 years after high school or postsecondary completion.
  - **High-Wage:** Proportion earning more than the median Arkansas wage.

Matching Analysis

For the analysis, we will match CTE students with students who have similar characteristics. We will then use statistical analysis to compare their outcomes.

By comparing similar students who participated in CTE vs those who did not, we hope to isolate the impact of CTE programing on student outcomes.

We will use the following criteria to match students:

1. **Participation in a CTE Pathway**
Students will be sorted into four different groups:
   - Never earned credit in a CTE course
   - Earned credit in one CTE course
   - CTE Concentrators
   - CTE Completers

2. **Student Characteristics**
   - Gender
   - Race/ethnicity
   - Free or reduced-price lunch status
   - English language learners
   - Students with disabilities signaled with an IEP

3. **Engagement and Motivation**
   - Attendance rates in 8th grade
   - Number of discipline infractions in the 9th grade
   - Grade 8 Standardized Test Scores

ROI Analysis

- Our analysis will be similar to a recent analysis conducted in Massachusetts.
  - *At What Cost?: Is Technical Education Worth the Investment?*
- We will estimate the monetary value CTE program participation and program costs.
- We will then use these estimates to calculate state/district return on investment.

Estimating Benefits: We plan on monetizing the following lifetime benefits associated with CTE participation:

- Lifetime earnings,
- Lifetime tax revenue,
- Savings from reduced enrollment in Medicare/Medicaid and other welfare programs, and
- Savings from reductions in crime.

Estimating Cost: To calculate the amount spent we will use the following data:

- School district budgets and spending,
- State CTE related budgets and spending, and
- Federal funding.

Findings & Recommendations

Findings & Recommendations: CTE Program Quality

➔ **Finding:** CTE completers have low rates of early postsecondary credit and industry credential attainment and postsecondary matriculation, suggesting that too many CTE pathways are "dead ends" and do not articulate or transition seamlessly to postsecondary credential programs.

◆ **Recommendation:** Ensure that every CTE program of study articulates to a postsecondary credential CTE program. All students enrolled in CTE programs of study should have access to early postsecondary credit offerings aligned to a postsecondary credential.

◆ **Recommendation**: Establish statewide articulation agreements across 2-year and 4-year colleges and universities to ensure college credits earned in K–12 or at one institution transfer and count toward a degree at another. Include technical credit (CTE) and valued industry credentials under the agreements to help students earn more quickly a postsecondary credential.

Postsecondary Articulation in Leading States

Both **Colorado** and **Florida** have established robust statewide articulation agreements across their community and technical colleges and 4-year universities. As part of its agreement, **Florida** offers college credit for valued industry credentials earned by students. **Colorado's** agreement ensures that dual and concurrent enrollment credit can be applied to a CTE program or are transferable via "guaranteed transfer pathways."

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Findings & Recommendations: CTE Program Alignment

➔ **Finding:** There is significant directional misalignment between the most completed programs of study and high demand, high skill, higher wage occupations or industry sectors.

◆ **Recommendation:** Strengthen alignment between programs of study and H3 occupations. This may include making changes to existing programs of study, creating new programs of study to address gaps between labor market needs and offerings, or phasing out legacy programs that are not projected to grow or meet H3 occupation expectations.

◆ **Recommendation:** Consider ways to support school and district transitions to higher value programs through financial incentives or grants. Incentives should be aligned with those programs of study that provide the greatest ROI for students, communities and state/regional economies.

CTE Program Alignment in Leading States

Indiana prioritizes state and regional labor market data to develop and update CTE pathways offerings. It takes its lead from the Governor's Workforce Cabinet, which includes statewide and regional employers and business associations as key members. The Cabinet recently spearheaded efforts to design the state's "Next Level" CTE programs of study that are aligned to both occupational demand and postsecondary credential programs.

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Findings & Recommendations: CTE Program Quality *and* Alignment

→ **Finding:** The state's current funding system does not prioritize CTE programs in general, nor does it provide any incentive for pathway quality and alignment or student outcomes more broadly. CTE leaders in the state also noted sustainable funding for CTE as one of their top challenges.

◆ Prioritize direct funding of CTE and tier such funds based on the ROI of specific pathways to students, communities and state/regional economic priorities.

◆ Consider incentive funding for schools and districts that ensure students earn postsecondary and industry credentials in a high quality CTE pathway.

CTE Funding in Leading States

Both Texas and Tennessee fund CTE directly through a weighted and/or tiered system that heavily prioritizes pathways aligned with high demand, high skill, and higher wage occupations. They also provide outcomes bonuses to schools who graduate students that have <u>met a combination of high quality indicators</u> such as early postsecondary credit and industry and postsecondary credential attainment.

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Findings & Recommendations: Outcomes Measurement and Return on Investment

➔ **Finding:** The state does not routinely link CTE, higher education, and workforce data. Not having linked, longitudinal data makes it difficult to determine the outcomes that the state's CTE and other workforce programming are achieving or the return on those investments.

◆ **Recommendation:** Annually link CTE, higher education, and workforce data and work with third party experts to evaluate outcomes and estimate ROI.

➔ **Finding:** CTE stakeholders, including families with students, have limited ability to explore various programs of study, their alignment with higher education and workforce, or the potential outcomes of those programs.

◆ **Recommendation:** Develop and annually update interactive, web-based materials/dashboards that allow stakeholders to explore CTE and workforce programs of study and their potential outcomes.

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Findings & Recommendations: Data

→ **Finding:** The state's current definition of "CTE concentrator" is too broad in scope and does not reflect the intent of the federal Perkins V act. As a result the data for concentrators is inflated and not a valid reflection of concentration in a program of study.

- ◆ **Recommendation:** Change the existing definition from: "Students who enroll in a minimum of two (2) units of credit in a CTE program area" so that it is "Students who enroll in a minimum of two (2) *sequential* units of credit in *a CTE program of study*." Update data collection to capture the sequence within a program of study.

→ **Finding:** The number of students completing work-based learning courses is very low and may not reflect actual work-based learning activities in schools and districts.

- ◆ **Recommendation:** Require schools and districts to accurately report work-based learning completions as a course. This may require additional technical assistance or education about why this is needed and a critical outcome.

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