



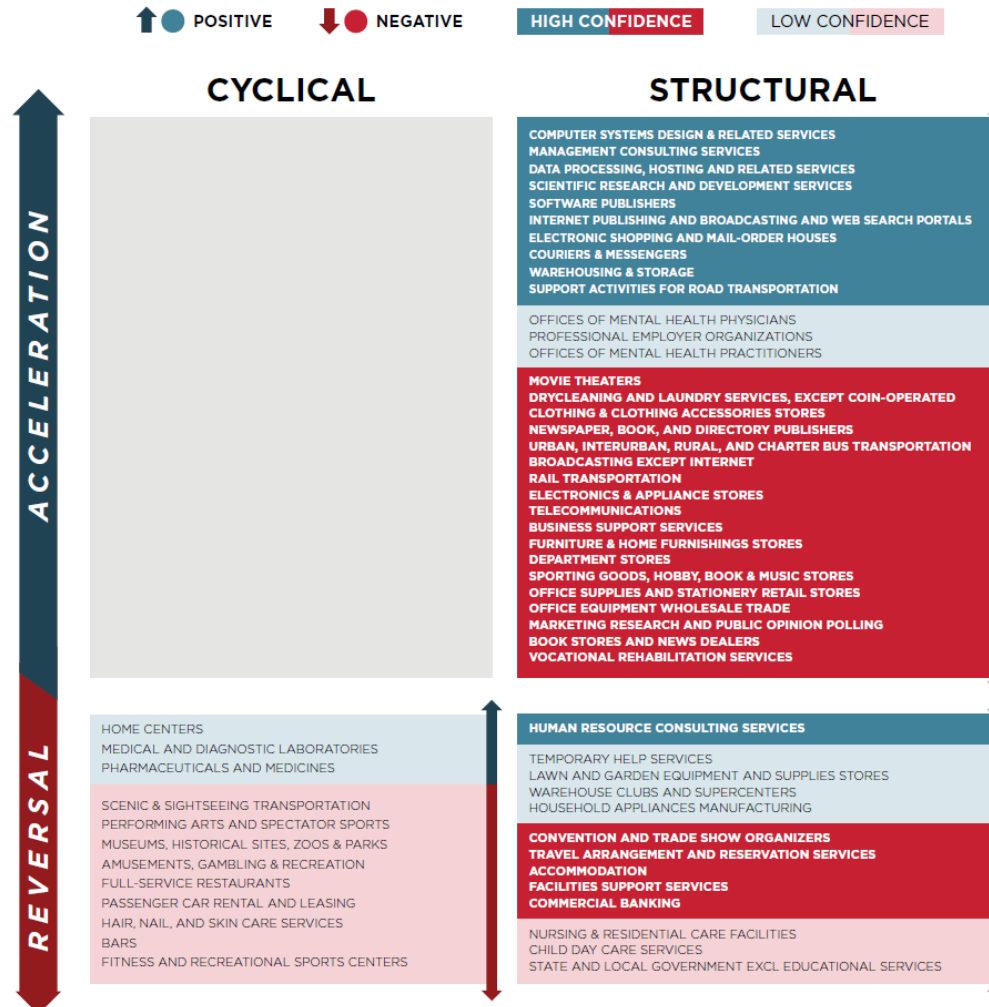
# A Skill Strategy for Disruption

*Ensuring Workforce Readiness & Worker Mobility in Times of Change*

**Matt Sigelman**  
**President, The Burning Glass Institute**  
**[msigelman@burningglassinstitute.org](mailto:msigelman@burningglassinstitute.org)**  
Federal Reserve Bank of Atlanta  
October 3, 2022

# The Through the Looking Glass Recovery

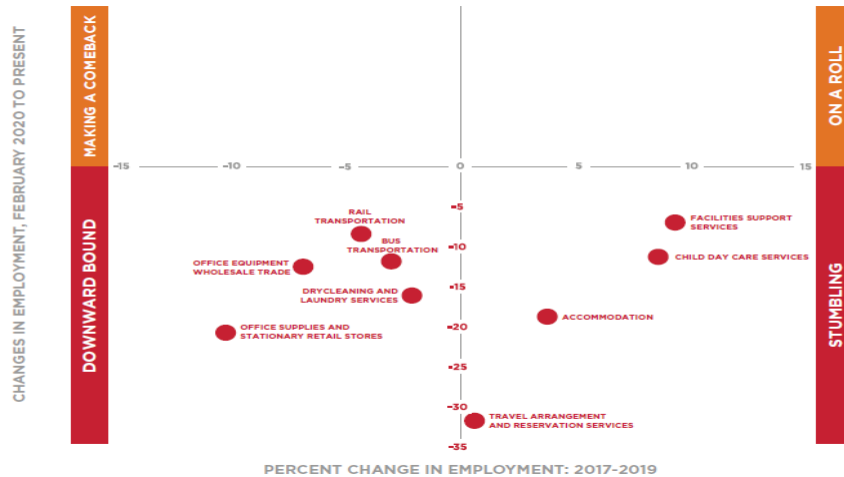
Overall, the job market is fully back but that masks seismic shifts in the economy. 1 in 6 sectors are still down >10%. Some may never recover



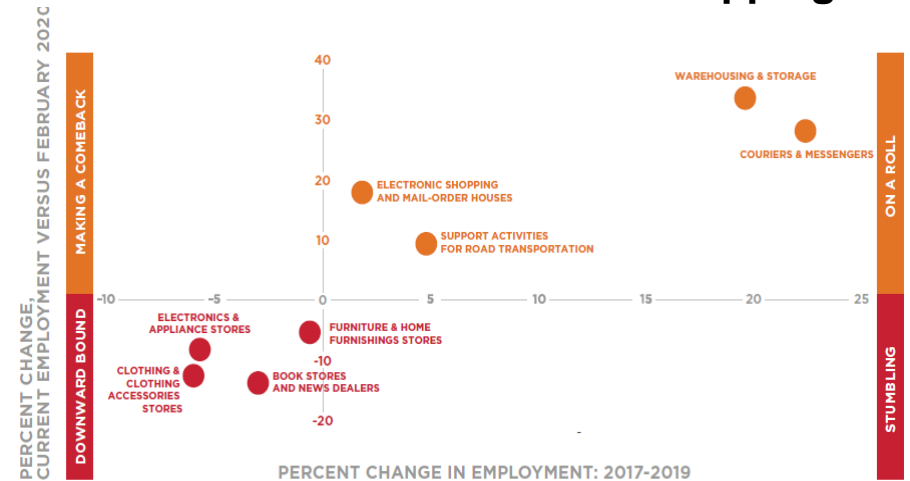
# The Pandemic Reshaped Opportunity

Four meta-trends have reshaped the post-pandemic career landscape

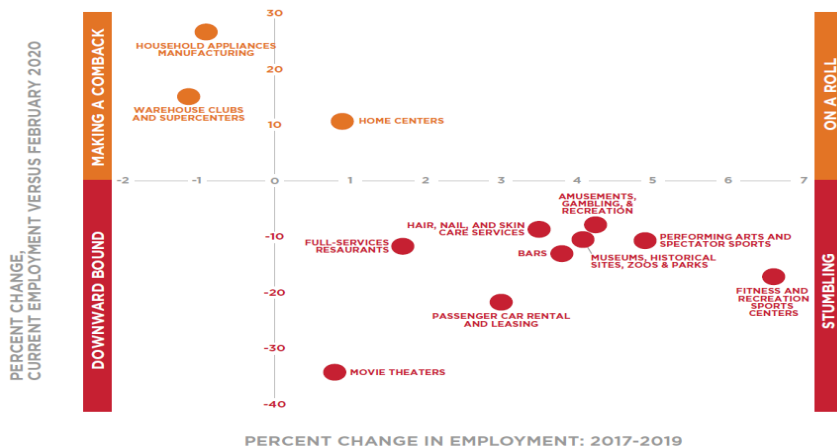
## The Shift to Remote Work



## The Acceleration of Online Shopping



## The Shift from Goods to Services



## Automation & Digital Transformation



# Worker Shortage or Skills Shortage?

37% of the skills of the average US job have been replaced over the past five years. What does it take to keep up?

**47% of the requirements for a Marketing Specialist are new...**

**...And the pandemic has accelerated the pace of change dramatically**

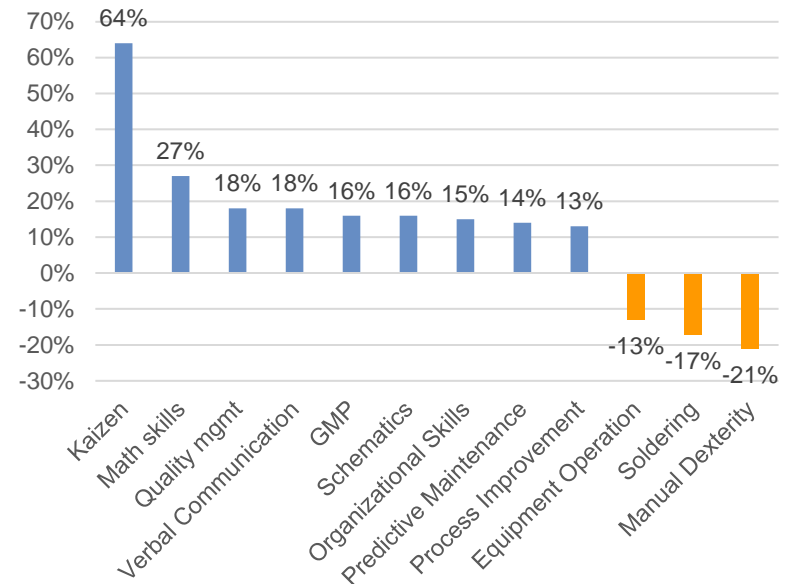
## Marketing Specialist Skill Requirements

Change in Requirements, 2020 vs. 2010



## Key Changes in Skills for Production Techs

Change in relative demand vs 2019



# Jobs Are Evolving in Profound Ways

Jobs increasingly require new skills from across domains, challenging workers' ability to learn them as they go

Jobs are having sex, leading to the emergence of a hybrid skill genome

Skills Not Jobs: Data science skills aren't just for data scientists

Occupations with at least 3K postings requiring data science / analytics/ mining

## Accountant

## Data Scientist

### ACCOUNTING

Accounting  
Account Reconciliation  
General Ledger  
Financial Statements  
Generally Accepted Accounting Principles  
Financial Reporting  
Balance Sheets

### SOFT SKILLS

Communication Skills  
Detail-oriented  
Excel



**+23%**  
Since 2013



**+598%**  
Since 2013

### PROGRAMMING

Python  
SQL  
Hadoop  
R

### DATA SKILLS

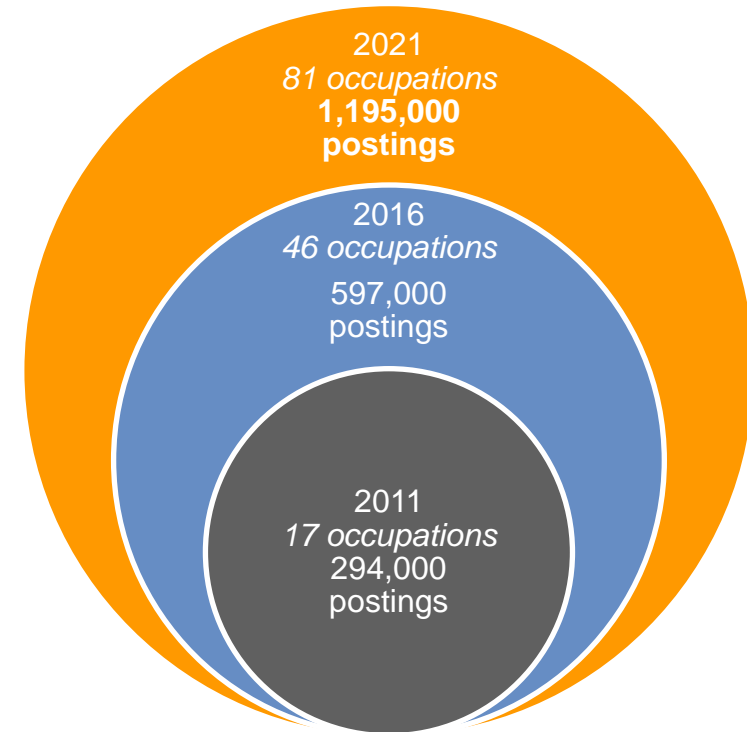
Data Visualization  
Tableau  
Excel  
MapReduce

### BUSINESS SKILLS

Predictive Models  
Business Process  
Economics  
Strategic Planning

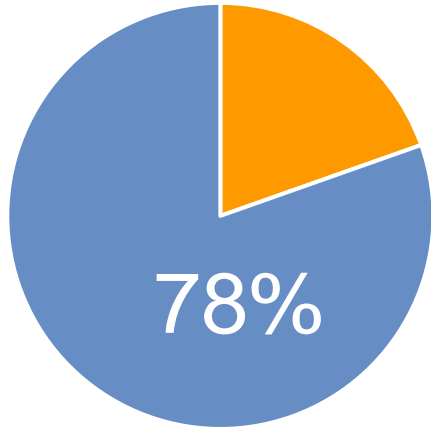
### SOFT SKILLS

Problem Solving  
Writing  
Teamwork

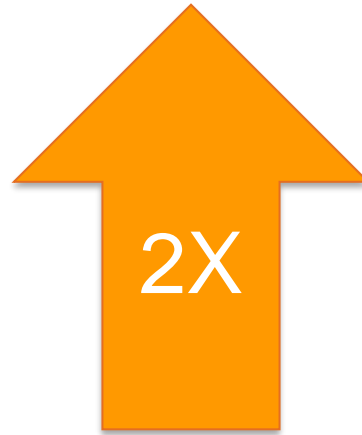


# A Sea Change In Middle Skills Too

## Digital Skills: A Minimum Ticket To Ride



Of middle-skill jobs require digital skills



Digitally intensive jobs are growing twice as fast as other middle-skill jobs

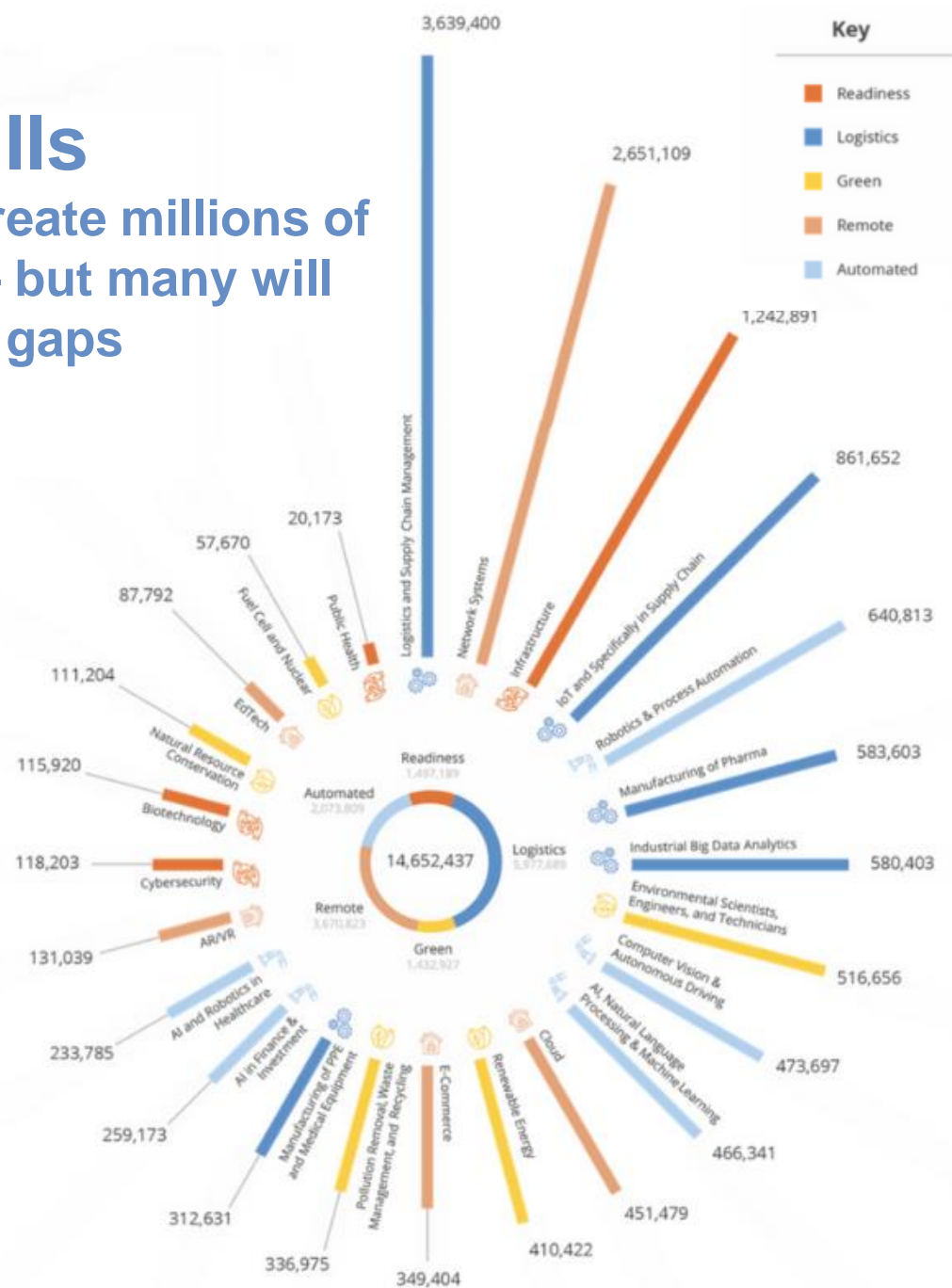


Digitally intensive jobs are twice as likely to pay a living wage

# New Growth, New Skills

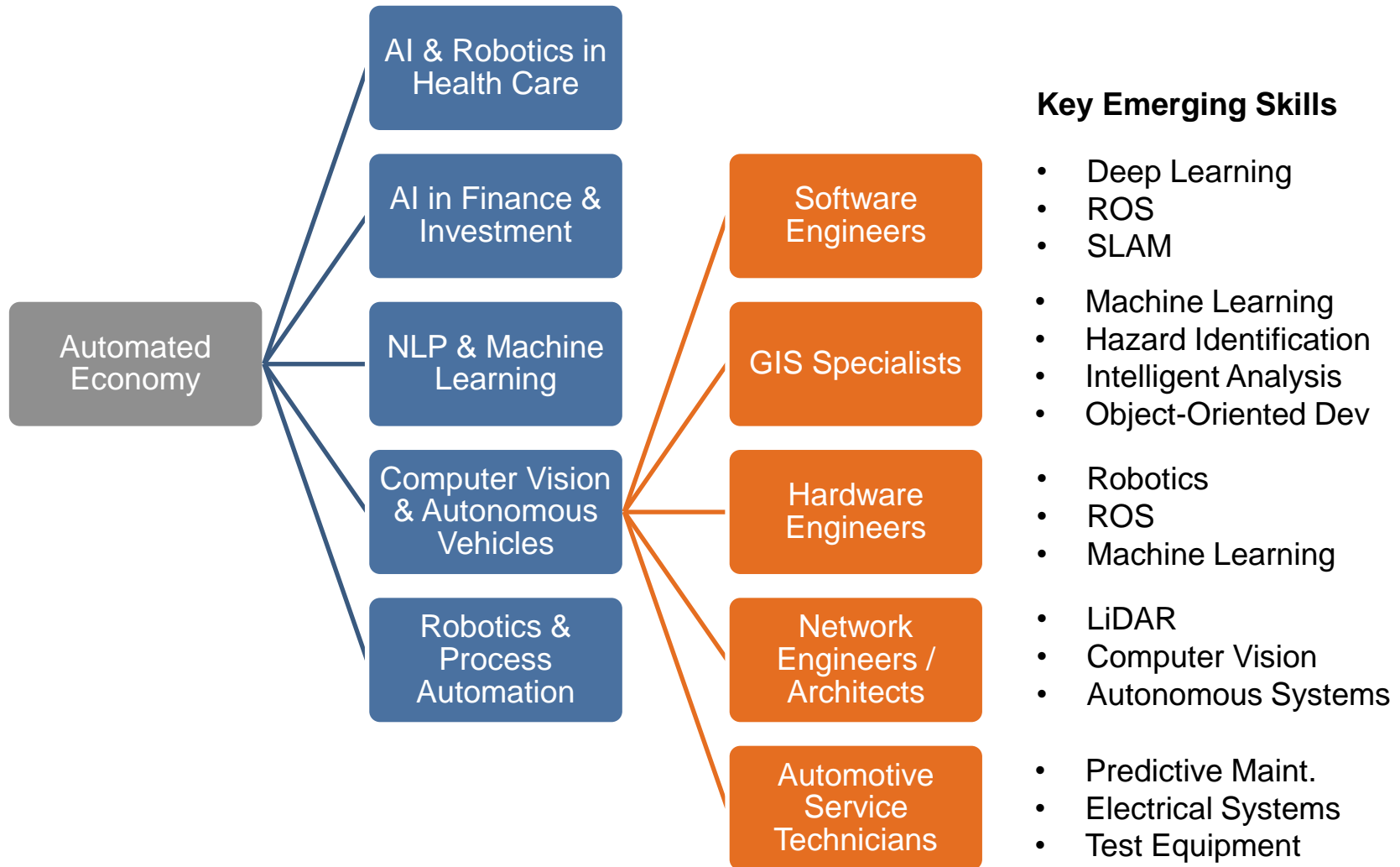
Five emerging economies will create millions of new jobs in the next five years – but many will require new skills, exacerbating gaps

	50% Increase Scenario	
Economy	Growth Rate	5-Year Openings Projection
Readiness	12.10%	1,756,874
Logistics	4.83%	4,549,046
Green	12.79%	866,902
Remote	16.67%	6,282,331
Automated	28.82%	4,548,798



# New Skills for New Opportunity

Build Talent for the Jobs & Skills Powering Emerging Growth Areas





# As New Technologies Intersect Familiar Roles, Workers May Need Radically Different Skills

## Deliver the Learning to Help Them Stay Relevant and Valuable

### Mechanical Engineers

Traditional Mechanical Engineer
Top Specialized Skills
Mechanical Engineering
Project Management
Mechanical Design
SolidWorks
AutoCAD
Budgeting
Scheduling
Product Development
HVAC
Repair

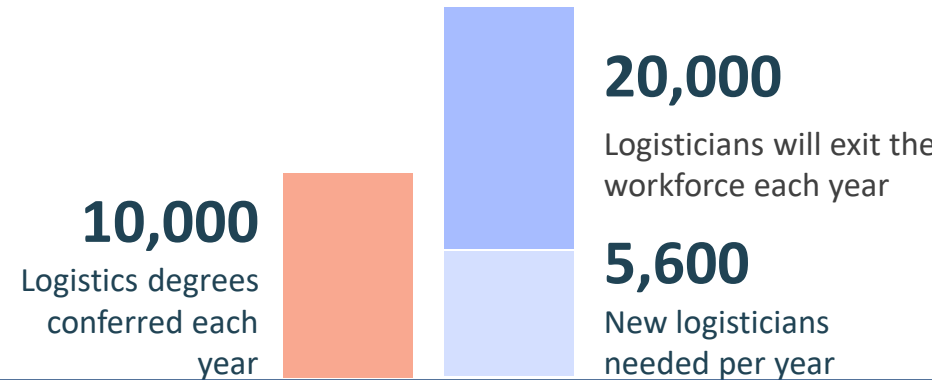
Vehicle-to-Infrastructure Specialist
Top Specialized Skills
Transportation Systems
C++
Global Positioning System (GPS)
Business Development
Civil Engineering
Hardware & Software Configuration
LiDAR
Simulation
Traffic Management
Linux

Autonomous Systems Specialist
Top Specialized Skills
Autonomous Systems
Mechanical Engineering
Robotics
Simulation
Python
C++
Systems Engineering
MATLAB
Machine Learning
Electromechanical Systems

# When It Comes to This Evolving Skill Landscape Existing Education Structures Struggle to Align

In many critical fields, the number of graduates is insufficient to keep up with rising demand.

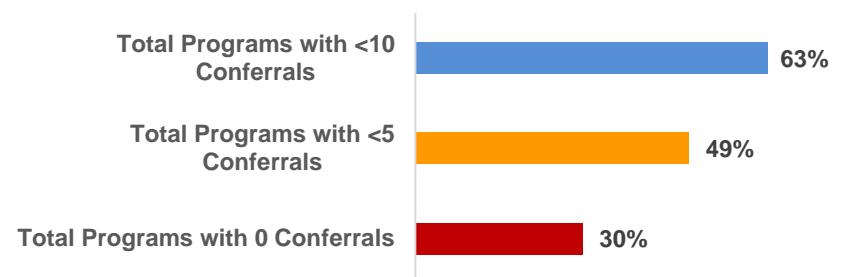
Only 18% of credentials earned in career & tech ed programs are in demand by industry while many needed certs go undersupplied



Rank	Credential	Credential Type	Credentials Earned	Percent Oversupplied	Supply/Demand Category	State Count
1	Microsoft Office Specialist		129,895	--		19
2	WISE Financial Literacy Certification		67,208	100%		7
3	NCCER - Core Curriculum		60,350	100%		12
4	Adobe Certified Associate		52,189	78%		19
5	Virginia Workplace Readiness Skills for the Commonwealth		42,313	100%		1
6	Basic First Aid		36,102	100%		11
7	NCCER - Carpentry		33,392	100%		14
8	IC3 Certification		22,840	100%		13
9	Automotive Service Excellence Certification		22,726	16%		24
10	ServSafe Certification (Manager/Food Handler/Allergens/Alcohol)		21,634	47%		20

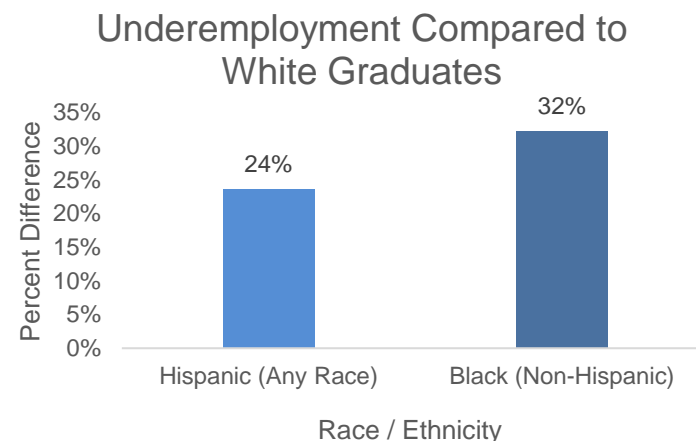
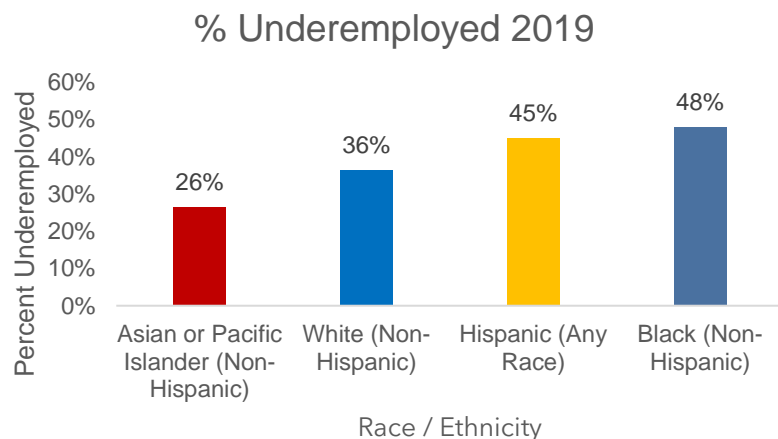
Five years after graduating their first class, two-thirds of programs are well below the threshold of financial viability

## 2018 Conferrals for Programs Started in 2013 and 2014

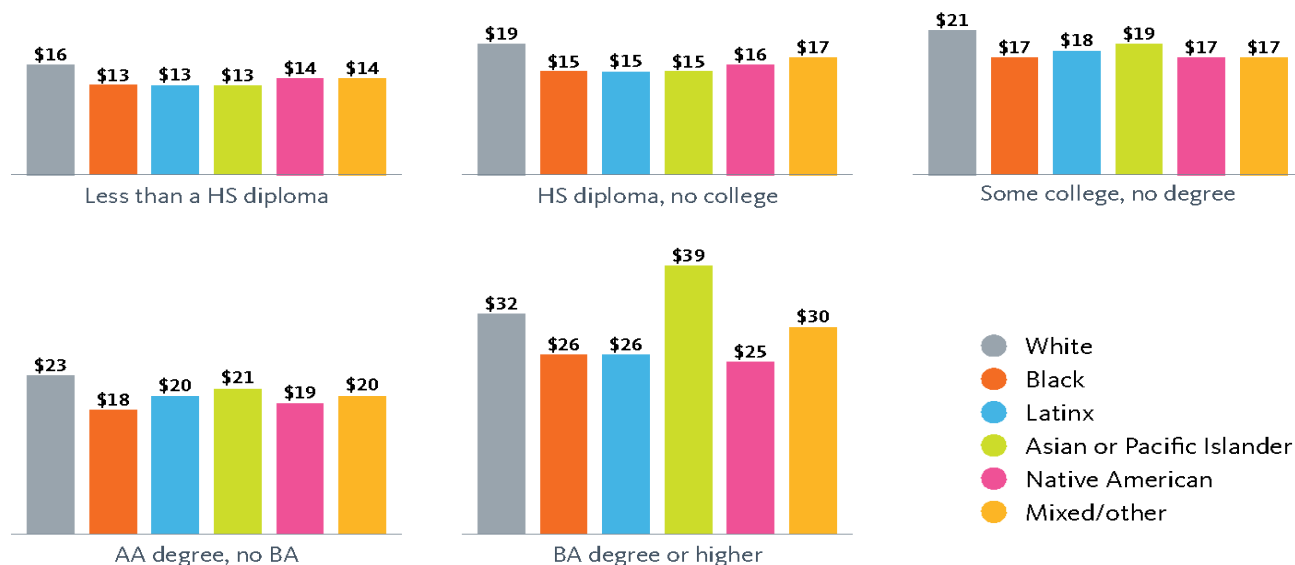


# Black Students Earn 81 Cents on the Dollar

## Is Education Still the Great Equalizer?

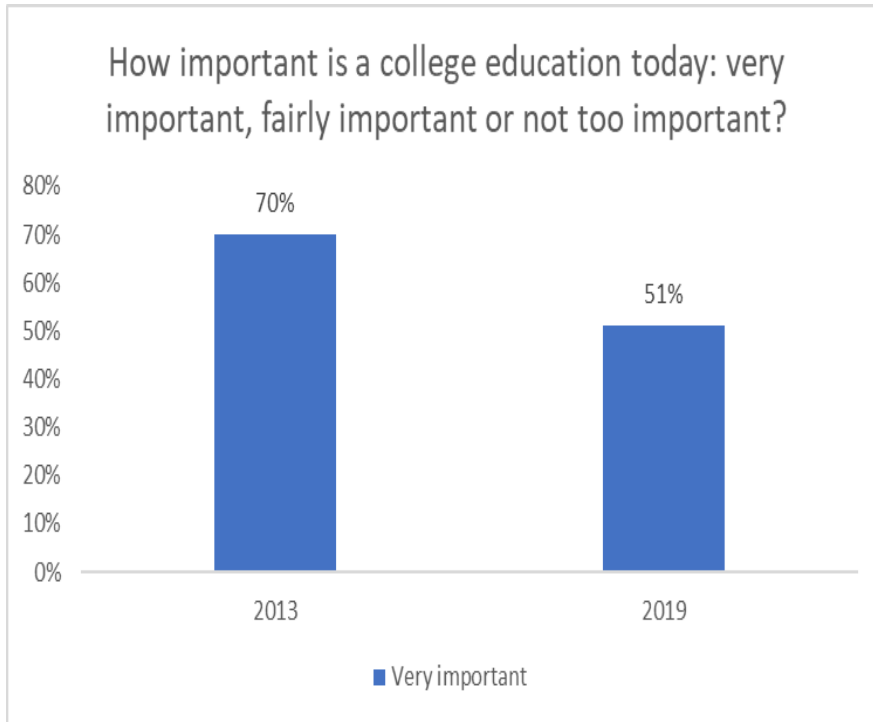


### Median Wage by Educational Attainment & Race, 2018



# How Do We Enhance the Value of Higher Education When a Degree is Perceived as Optional

**Major change in public perception:** The percent of Americans who view college education as important has fallen fast

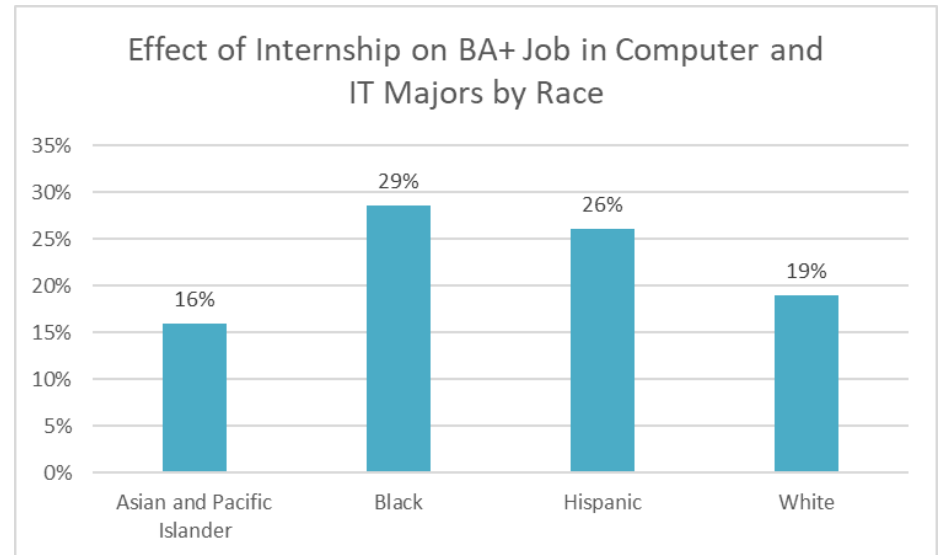
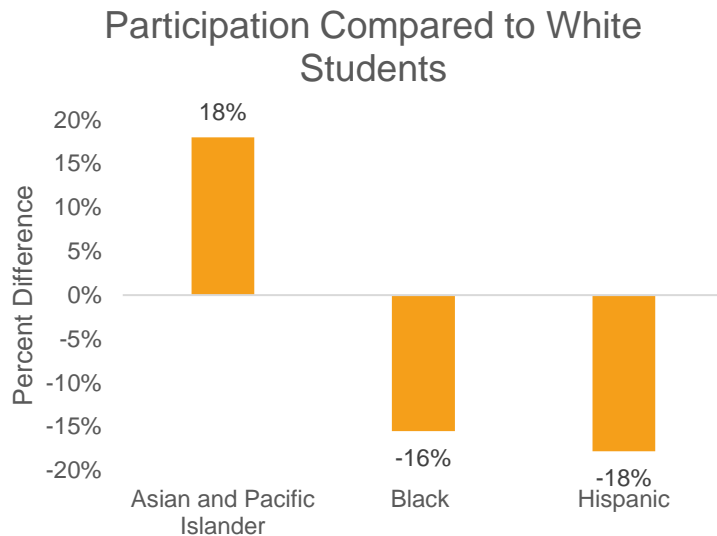


**Skills-base hiring is taking off:** It's good when employers hire for skills, not degrees but what does that mean for higher ed?



# Work-Based Learning Exercises New Skills

Students of color have less opportunity to pursue internships but, for those who do, the impact is huge. Integrating such experiences into the curriculum could change the game.



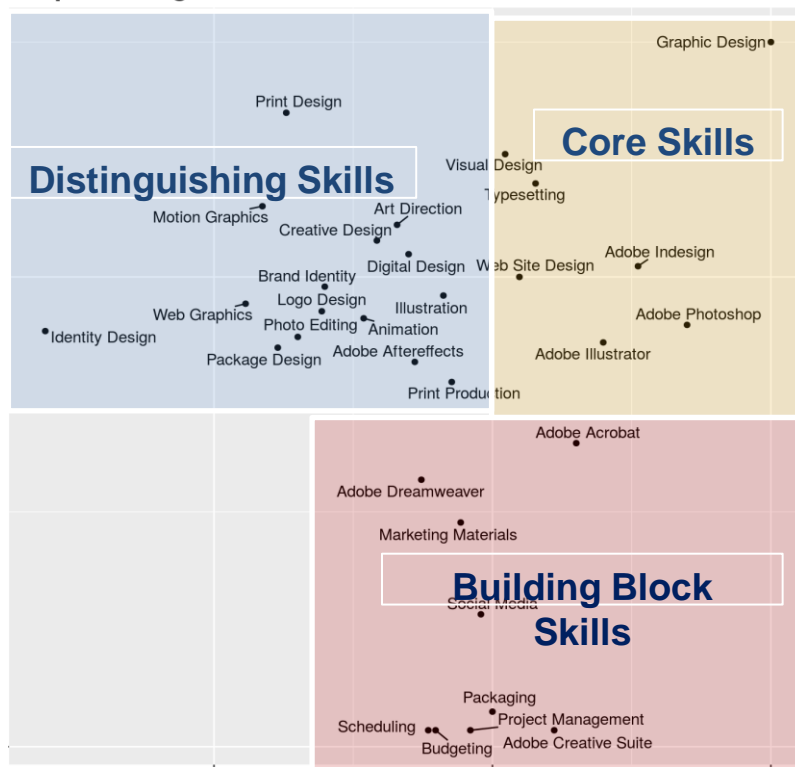
# Don't Just Train Skills

## Train the Skills That Matter

Ensure that curricula include not only core skills but also the **building block skills** that are often neglected and the **distinguishing skills** that set students apart

...while also developing the **new foundational skills** that are critical to a broad range of new economy work.

Graphic Designer / Desktop Publisher (BGTOcc)

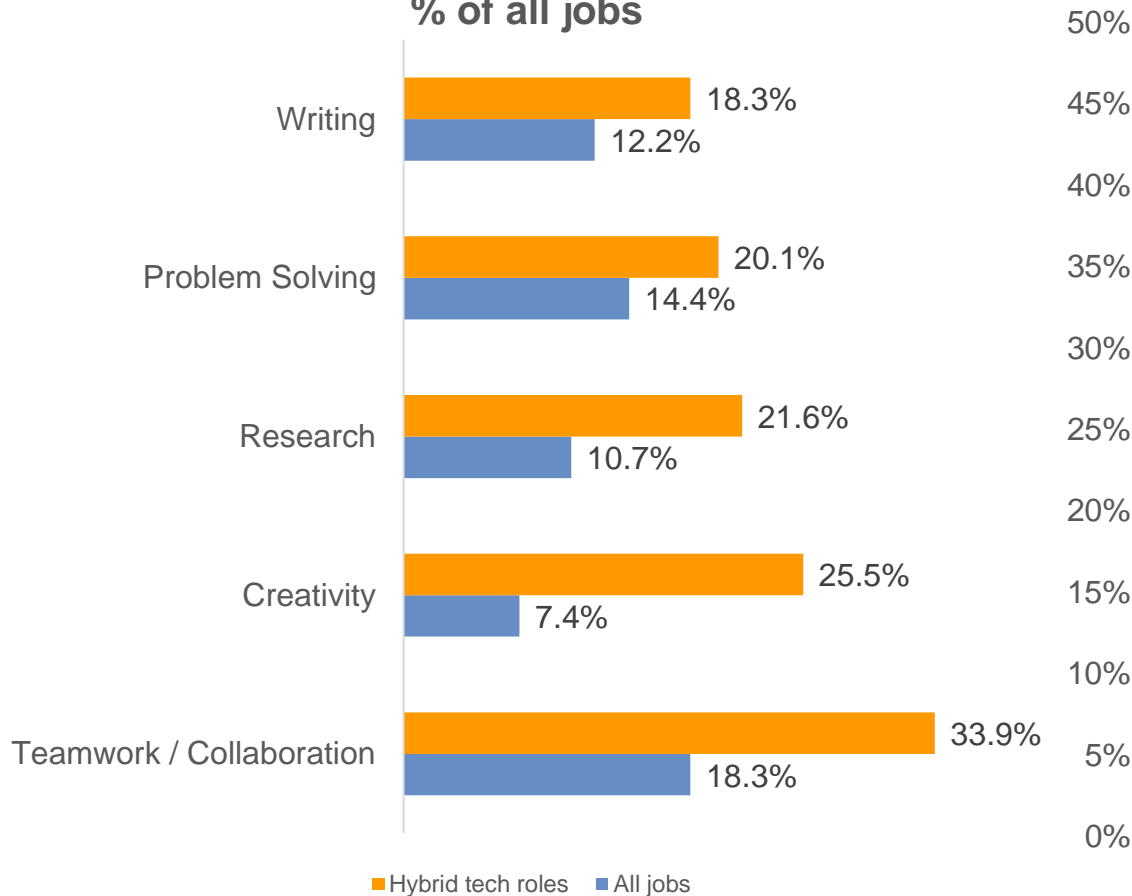


Foundational Skill Group	Foundational Skill Area	Growth in Number of Postings: 2017-2019	Share of Openings Outside IT and Analysis Job Families	Average Salary Premium
Business Enablers	Business Process	29%	67%	12%
	Project Management	51%	69%	14%
	Digital Design	44%	64%	-
	Communicating Data	101%	34%	27%
Digital Building Blocks	Managing Data	49%	28%	34%
	Analyzing Data	48%	55%	21%
	Software Development	48%	17%	43%
	Computer Programming	56%	13%	45%
Human Skills	Digital Security and Privacy	30%	29%	38%
	Communication	48%	81%	-
	Collaboration	58%	79%	2%
	Critical Thinking	52%	66%	0%
	Analytical Skills	44%	76%	1%
	Creativity	60%	82%	-

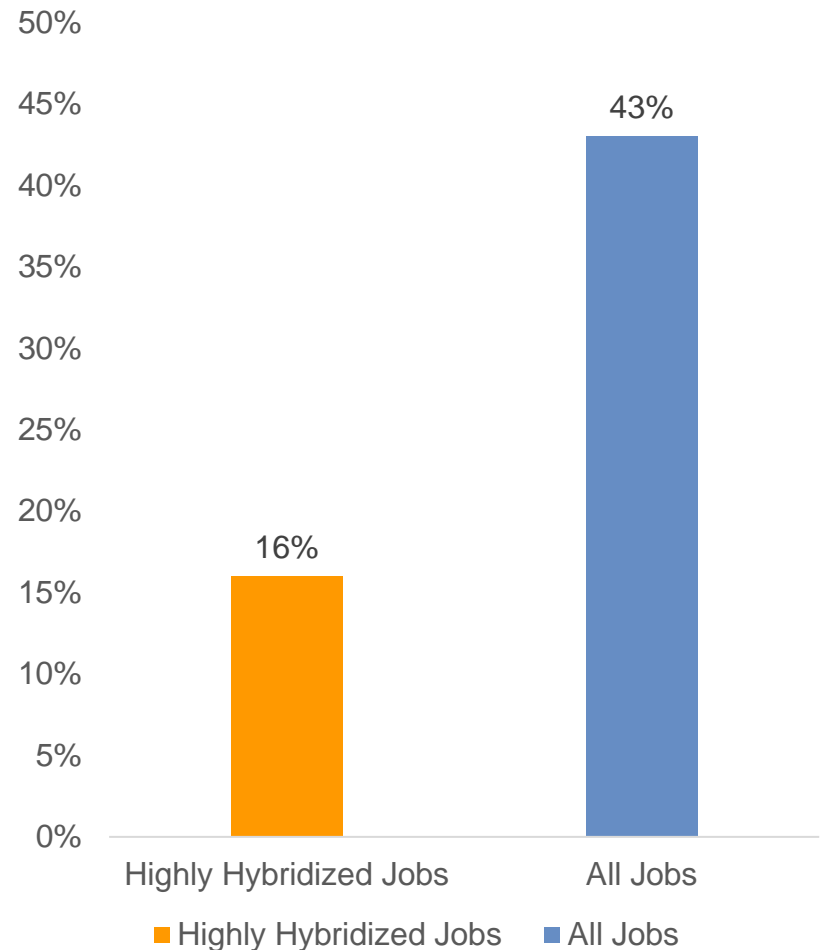
# High Value Work Demands Foundational Skill

## The New Foundational Skills are Central to New Economy Opportunity

% of hybrid jobs requesting key soft skills vs.  
% of all jobs



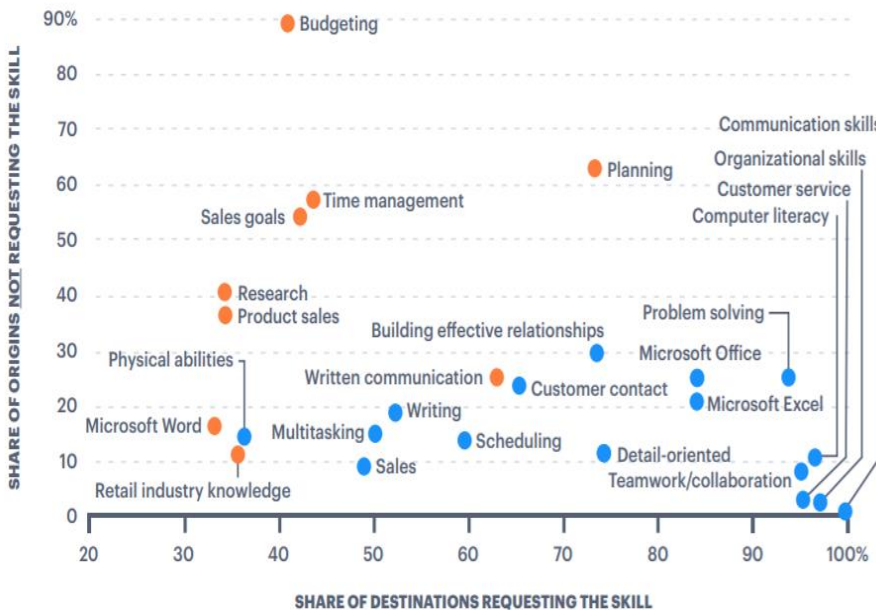
Vulnerability to Automation



# Not All Skills Are Created Equal

**Build skills that close the gap between low- and high-value work...**

Skills Gaps for Top Transitions from Lower-Wage to Opportunity Occupations



Note: The share of destinations requesting a skill is weighted by the employment of the destination occupations. The y-axis reflects the share of top transitions for which the skill ranks among the destination occupation's top 25 skills but not the origin's.

**...and dramatically increase the likelihood that workers will move up**

## Customer Service & Support Workers

Skill/Certification(*)	% Increase in Mobility Rate
Project Management	390%
Certified A+ Technician*	430%
Budgeting	280%
Hardware Experience	250%
Social Media	240%
Adobe Photoshop	200%
Quality Assurance and Control	180%

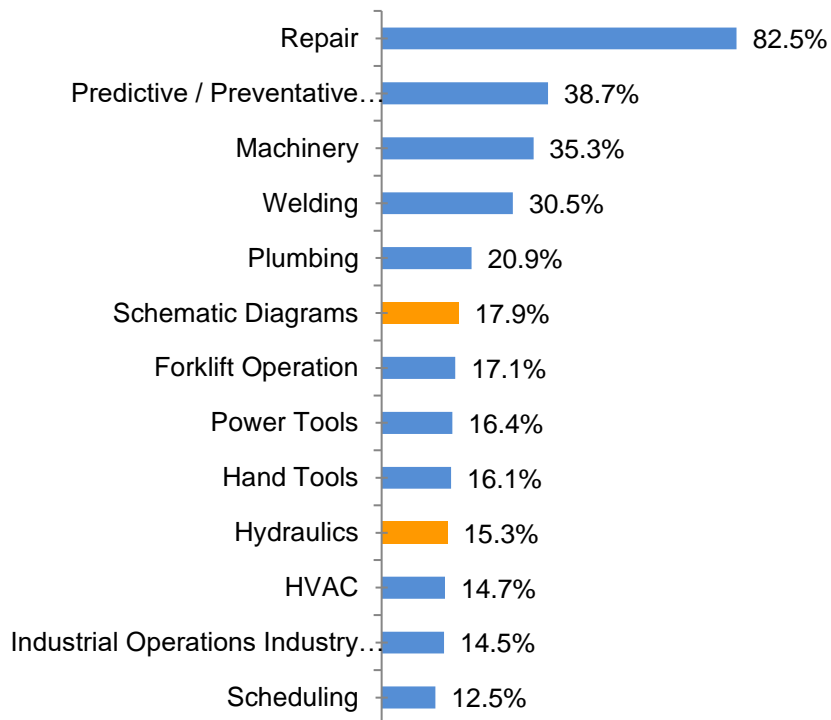
Source: Federal Reserve Banks of Cleveland & Philadelphia based on Burning Glass data



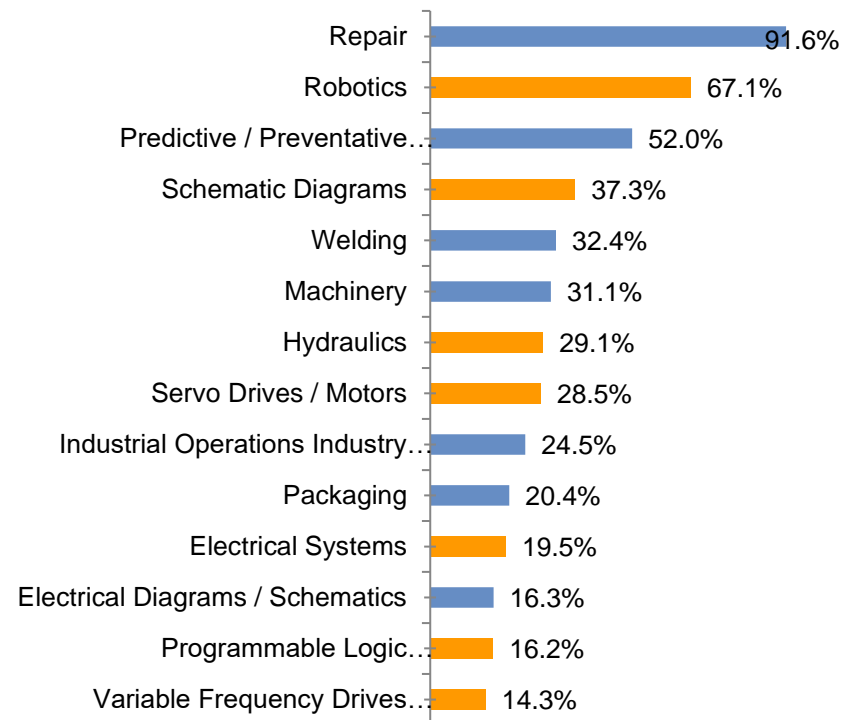
# Amidst Rising Wages & Short Supply, Grow Productivity by Investing in Skills

To offset rising wages and to make do with fewer workers, you need to boost productivity. Automation isn't the only tool for increasing productivity. Specific skills can make workers more productive and more valuable.

Skills for Maintenance Technicians,  
Overall



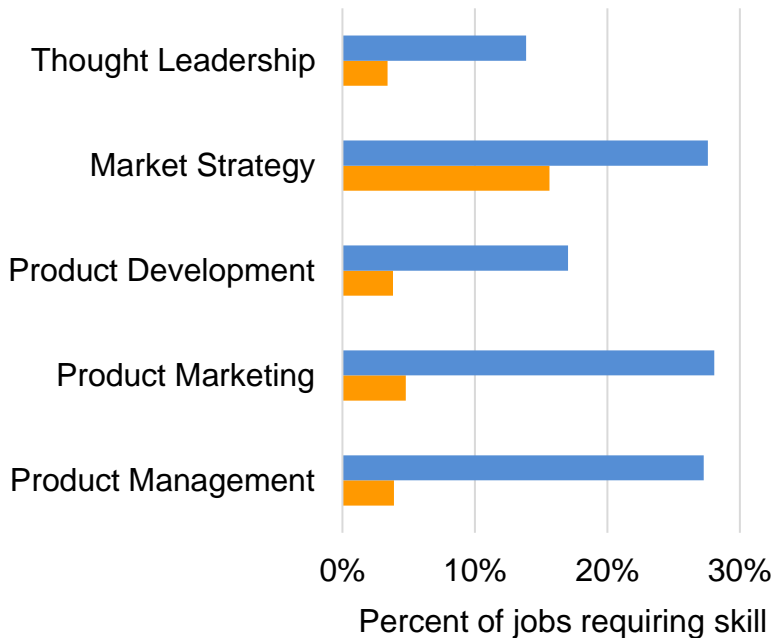
Skills for Maintenance Technicians,  
Robotics



# Skills Launch Careers

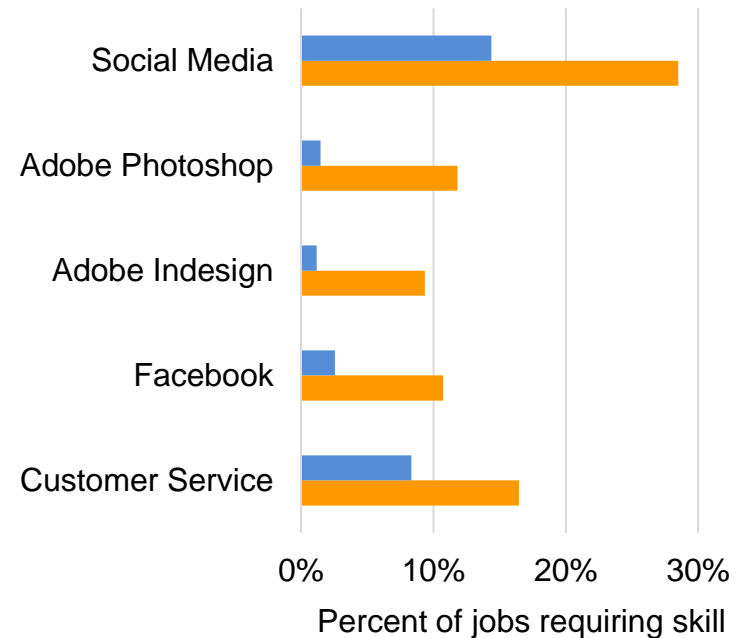
Help Learners Acquire Skills Associated with Better Paying Jobs & Higher Mobility

**High-Paying Skills for Marketing Managers**



■ Top Salary Quartile ■ Bottom Salary Quartile

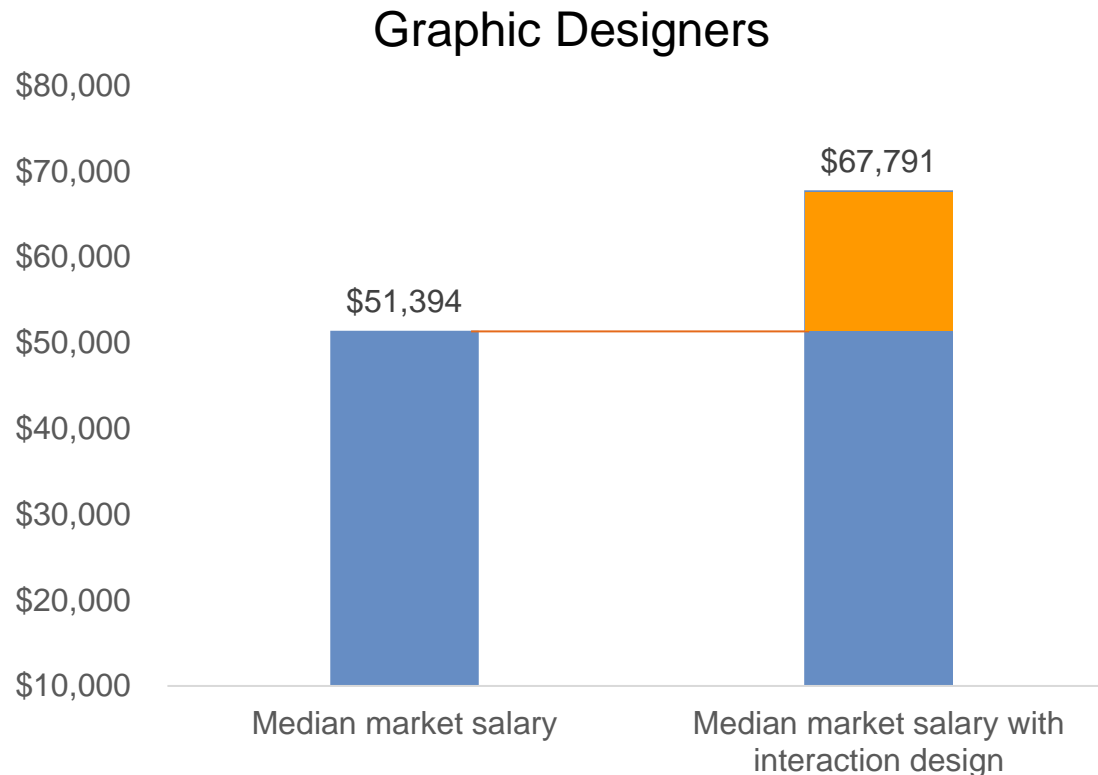
**Low-Paying Skills for Marketing Managers**



■ Top Salary Quartile ■ Bottom Salary Quartile

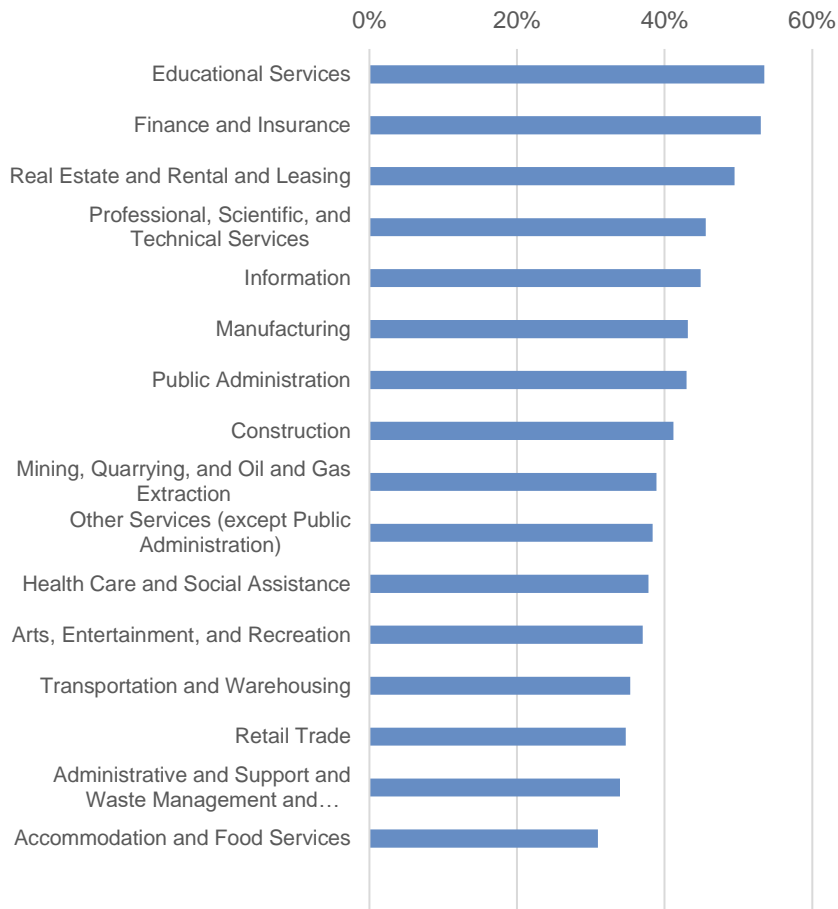
# Skills Arbitrage Careers

## It Doesn't Cost \$16,000 To Learn Interaction Design

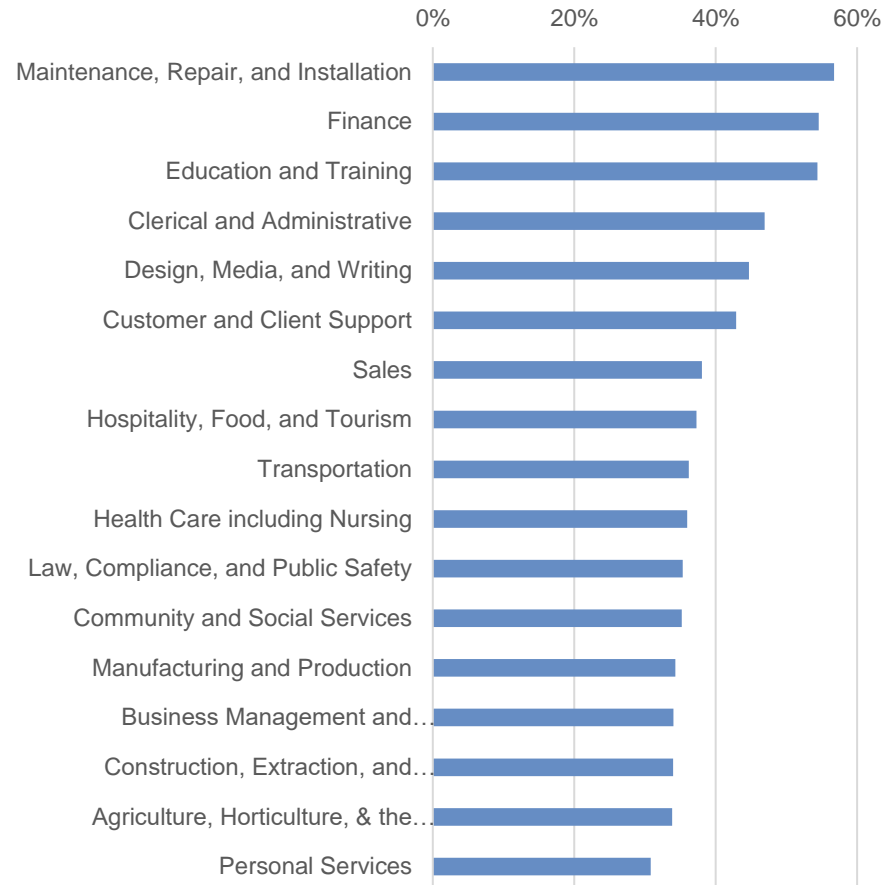


# When It Comes to Moving Up, Where You Start Matters

**% of Workers Who Move Out of Poverty Trap Jobs by Starting Industry**



**% of Workers Who Move Out of Poverty Trap Jobs by Starting Career Area**



# There Must Be 50 Ways To Leave Retail

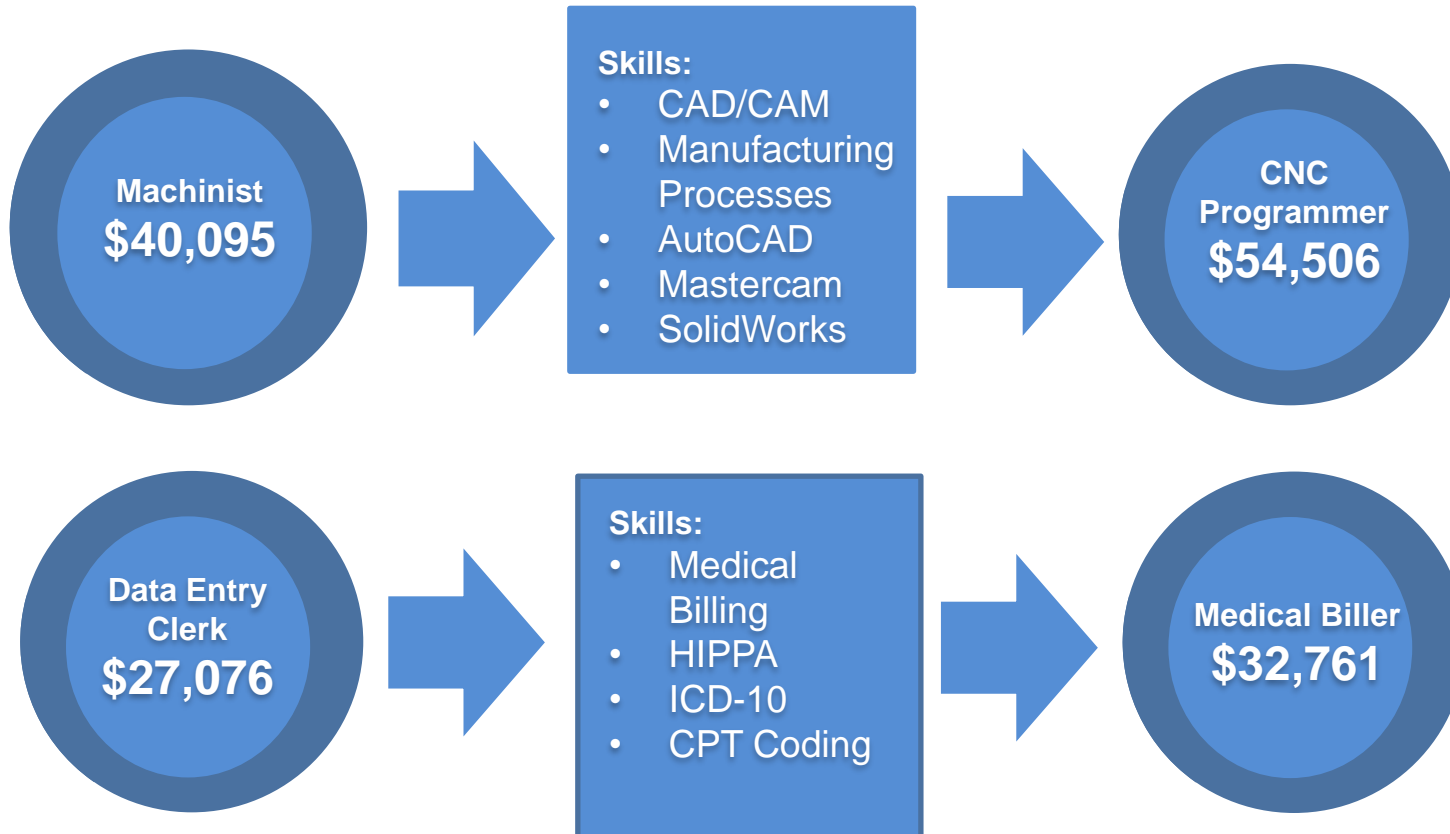
## Help Workers Over Time, Not 'Once & Done'

Career Area	% of Workers in Career Area after 5 Years	% of Workers in Occupations with Low to Moderate Probability of Automation	How much safer or at risk than the nation?
Core Retail (e.g. Retail Sales)	33.5%	35%	0.95
Administrative	15.7%	13%	0.35
Customer Service	12.3%	8%	0.22
Food	6.2%	0%	NA
General Sales	5.9%	95%	2.57
Finance	5.5%	18%	0.49
Health Care	4.2%	40%	1.08
Hospitality	3.7%	19%	0.51
Restaurant Management	3.4%	14%	0.38
Retail Operations: Logistics	3.0%	20%	0.54
<b>IT</b>	<b>2.4%</b>	<b>100%</b>	<b>2.70</b>
Call Center	1.1%	4%	0.11
Retail Operations: Merchandising	1.1%	100%	2.70
Real Estate	0.9%	0%	NA
Retail Operations: Buyers	0.6%	0%	NA
Hospitality Management	0.3%	100%	2.70
Auto	0.2%	0%	NA
Total	100%	38%	1.02

# Build Skills to Help Workers Rise

Identify the Specific Skills That Will Help Advance Careers






WORLD  
ECONOMIC  
FORUM



# Diversity isn't a Zero-Sum Game

## Skill Adjacency Can Map Pathways to a More Equitable Future

*For example, Shipping Clerks can access higher paying, historically less diverse roles like Operations Coordinator through building on existing skills*

Role	Average salary	% people of color <sup>1</sup>	Key skills to add
 <b>Shipping Clerk</b>	~\$27,500	~41%	N/A
			
 <b>Inventory Specialist</b>	~\$32,500	~31%	<ul style="list-style-type: none"> <li>• Inventory management</li> <li>• Bills of lading</li> <li>• Excel analysis</li> </ul>
			
 <b>Operations Coordinator</b>	~\$37,000	~23%	<ul style="list-style-type: none"> <li>• Worker management</li> <li>• Planning analysis</li> <li>• Project management</li> </ul>

1. Defined as Black or Hispanic  
Source: Burning Glass data

# Upskilling Underleveraged Talent Communities: The Key to Equitable Growth

## Destination Occupation: Industrial Production Manager

**650+**

**Job Postings in Cleveland, 2019**

*Total number of postings in Cleveland MSA for this occupation.*

**44%**

**In Manufacturing**

*Percent of total postings in 2019 that were in the targeted sector*

**26%**

**Entry Level**

*Percent of job postings calling for 0-2 years of experience and no BA degree*

**13.5% Hispanic/Latino**

**Average Salary:**

**\$108,000**

*Average salary for this occupation in Cleveland*

**Current Talent Pool:**

**2,450 Workers**

*Number of workers in this profession in Cleveland*

**Expanded Talent Pool:**

**Pool:**

**+8,860 Workers**

*Number of workers in related professions, from which employers could hire into this occupation*



**17.2% Hispanic/Latino**

**Life, Physical, and Social Science Technicians**  
+480 current workers  
\$51,000 average salary  
**Skills to Acquire:**  
Quality Management, Good Manufacturing Practices (GMP), Six Sigma, Supervisory Skills

**Occupational Health and Safety Technicians**  
+120 current workers  
\$53,730 average salary  
**Skills to Acquire:**  
Quality Management, Quality Assurance and Control, Good Manufacturing Practices (GMP), Lean and Continuous Improvement Methodologies, Six Sigma

**Engineers, All Other**  
+1,310 current workers  
\$99,000 average salary  
**Skills to Acquire:**  
Budgeting, Planning, Key Performance Indicators (KPIs), Change Management, Operations Management

**Transportation, Storage, and Distribution Managers**  
+920 current workers  
\$98,510  
**Skills to Acquire:**  
Production Management, Lean and Continuous Improvement Methodologies, Lean Manufacturing, Quality Assurance and Control, Pipeline Planning

**First-Line Supervisors of Production and Operating Workers**  
+6,030 current workers  
\$64,020 average salary  
**Skills to Acquire:**  
Production Management, Budgeting, Planning, Pipeline Planning, Quality Management

**23.2% Hispanic/Latino**



**Matt Sigelman**  
msigelman@burningglassinstitute.org