2018 Kentucky Summit on Registered Apprenticeship
Conference Materials

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Kentucky Registered Apprenticeship Summit
Kentucky Exposition Center
September 10-12, 2018

WORKING AGENDA

September 10, 2018

8:00-9:00 a.m.

Registration and Continental Breakfast

9:00 a.m.

Welcome Address

Governor Matt Bevin
Secretary Derrick K. Ramsey

9:30 a.m.-10:15 a.m.

2030: The Workplace Revolution
Josh Davies, CEO, Center for Work Ethic Development

10:30 a.m.- 11:00 a.m.

U.S. DOL Standards for Apprenticeship
Dr. Diana Elliott, Senior Research Associate, Urban Institute

All plenary sessions from 9:00 a.m. through the luncheon are located in Ballroom 201-203.
11:00 a.m.- 11:30 a.m.

Competency-Based Education: Scaling New Models for Student Learning
Dr. Charla Long, Founder, Competency-Based Education Partners

11:30 a.m.-12:00 p.m.

Innovative School to Work Programs
Andrew Sezonov, General Manager, WPC Group Apprenticeships, Australia

12:00 p.m.-1:15 p.m.

The Kentucky Leadership Continuum (meet the Cabinet Secretaries) Luncheon

1:15 p.m.-2:15 p.m.

Workshops

Becoming Competent in Competency-Based Education- Meeting Room C101
Dr. Charla Long

In this session, participants will learn how to leverage competency-based principals to address workforce challenges and the needs of adult learners.

Facilitator: Brett Hurst, Executive Staff Advisor, Office of Communications

Apprentices & State Government Opportunities- Meeting Room C104
Allyson Foster, Executive Advisor, Cabinet for Health and Family Services
Ramona Brock, Executive Advisor, Kentucky Transportation Cabinet
Brian Hiles, Assistant Director, Commonwealth Office of Technology
Greg McCall, Special Assistant, Commonwealth Office of Technology
Diana Jarboe, Coordinator, Registered Apprenticeship Program

This breakout session will detail steps to integrating Registered Apprenticeships into state government agencies. Presenters will share the successes of the model, and discuss the benefits of creating a workforce pipeline through participation in the program.

Facilitator: Elizabeth Hack, Executive Assistant, Workforce Investment

All plenary sessions from 9:00 a.m. through the luncheon are located in Ballroom 201-203.

Healthcare- Meeting Room C105
Anne Wetmore, H-CAP Subject Matter Expert
Tracy Osborne Clay, Coordinator, Registered Apprenticeship Program

This session focuses on the role of apprenticeship in the dynamic healthcare industry. Healthcare is continuously evolving, as new regulations, technological advances, and changing patient demographics emerge. Apprenticeships are demonstrating benefits for both employers and workers.

Facilitator: John Pallasch, Executive Director, Office of Employment and Training

Innovations in Apprenticeship and Intermediary Programs- Meeting Room C108
Nicholas Wyman, Institute for Workplace Skills and Innovation

There is a huge shift happening in the United States right now: a return to the time-honored tradition of apprenticeship. Apprenticeship is the Western World's oldest form of occupational training, and with good reason. By learning first-hand from an experienced tradesperson, an apprentice acquires mastery of a trade, inside and out. It is a hands-on method that equips participants with exactly the right skills and experience to transition directly into a particular job. Modern apprenticeships are innovative and have countless advantages for employers and the economy on the whole, as well as for anyone, at any stage of life, looking to launch a successful, well-paid, and fulfilling career.

Facilitator: Josh Benton, Deputy Secretary, Kentucky Education & Workforce Development Cabinet

Using the New Apprenticeship Standards- Meeting Room C109
Dr. Diana Elliott

In cooperation with the U.S. Department of Labor's Office of Apprenticeship (OA), the Urban Institute and its partners have been building national frameworks for Registered Apprenticeships in a wide array of occupations. They provide a readymade framework for a variety of occupations and apprenticeships that employers and others can use to fast-track the development of a registered apprenticeship. Unlike existing approaches to registering programs, these frameworks are not linked to any one employer or group of employers. They are not proprietary and are available as a tool to all. This session will provide participants with a close-up view of the frameworks.

Facilitator: Holly Neal, Communications Director, Kentucky Career Center

Multimodal Transportation Logistics- Meeting Room C112
Barbara Murray, CEO TransPORT
Katie Adams, Project Manager, TransPORT
Brenda Demic, Coordinator, Registered Apprenticeship Program

The goal of this session is to provide employers with an opportunity to share workforce needs and receive technical assistance to develop a sustainable apprenticeship program as part of an overall talent solution strategy specific to transportation logistics. Participants will receive samples of customizable apprenticeship program standards for adoption at your worksite, an interactive guide to program development, introductions to local educators and potential partners, and information on available funding.

Facilitator: Kim Brannock, Information Office Supervisor, Office of Communications

ABC's of Registered Apprenticeships in Kentucky- Meeting Room C110-111
Stephen Tressler, Coordinator, Registered Apprenticeship Program

Stephen Tressler will discuss the steps necessary to build your own apprenticeship program.

Facilitator: Alex Englen, Executive Advisor, Communications, Education and Workforce Development Cabinet

2:30 p.m.-3:30 p.m.

Workshops Repeat*

Building K-12, Higher Education, and Workforce Partnerships*
Dr. Charla Long

In this session, participants will hear ways high schools and universities are utilizing CBE frameworks to build a more equitable, workforce-ready education system and learn strategies for doing the same in Kentucky.

***New session- not a repeat of prior session.**

3:40 p.m.- 4:30 p.m.

Closing Keynote Address
Nicholas Wyman, Institute for Workplace Skills and Innovation

Drawing

Welcome

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Commonwealth of Kentucky
OFFICE OF THE GOVERNOR

Matthew G. Bevin
Governor

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Frankfort, KY 40601
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August, 08 2018

Dear Friends:

Welcome to the Kentucky Registered Apprenticeship Summit. I have stated many times that it is my vision to see Kentucky become the nation's Engineering and Manufacturing hub of excellence. Apprenticeship programs are a big part of fulfilling that vision. These programs provide career pathways for those just entering the workforce as well as a means to broaden opportunities for those looking to expand their careers.

Ever since Kentucky's Labor Cabinet launched the Kentucky Trained, Kentucky Built campaign, their Division of Apprenticeships has worked closely with private sector partners to continue the expansion of apprenticeships tailored to meet employer needs. The momentum that we were enthused about at last year's sumit has continued and we are working to see apprenticeship programs expand across the Commonwealth.

Apprenticeships can do more than improve a career, they can change a life. In keeping with our policy recommendations in the Work Matters Task Force Report, our "Justice to Journeyman" program is ongoing. This initiative provides inmates and youth a path to earn nationally recognized journeyman credentials in a skilled trade. I recently co-authored an Op-Ed for USA Today on the importance of giving those who are trying to turn their lives around, a second chance. Giving these individuals a productive path back into society reduces recidivism and enriches our communities.

Our state is on the cusp of great things! We have everything we need to make my vision a reality and we are well on our way, with $9.2 billion in new economic development last year. I hope that you will learn much at this summit, expand your networks and be a part of expanding apprenticeships and changing the trajectory of people's lives.

Sincerely,

Matthew G. Bevin
Governor

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Summit Faculty

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Mary Elizabeth Bailey
Commissioner
Department of Human Resources Administration
Kentucky Personnel Cabinet

Mary Elizabeth has worked in State Government, specifically in Human Resources, for more than 20 years. Throughout her career she has served on numerous committees and is a member of the National Association for State Personnel Executives, International Personnel Management Association, and Society for Human Resource Management. In her role as Commissioner, she oversees the administration of the Commonwealth's employment application process; state payroll functions; official personnel records for state employees; the state Classification and Compensation system; and the statewide Performance Management Program. Ms. Bailey attended Kentucky Wesleyan College where she majored in Business Administration. She resides in Frankfort with her husband Todd Bailey and their three children.

Ramona Brock
Executive Advisor
Kentucky Transportation Cabinet

Prior to joining the Cabinet in March 2007, Ramona spent 21 years in the U.S. Navy as a Personnelman, Navy Counselor, and Recruiter. She was certified as a navy instructor and master training specialist and retired as a chief petty officer. Ramona began her career with the Transportation Cabinet in the Office of Human Resource Management, where she administered the Civil Engineering Scholarship Program prior to becoming the Branch Manager. Ramona is currently serving as an Executive Staff Advisor within the State Highway Engineer's Office. She earned her bachelor's degree in Business Management from the Indiana Institute of Technology and a master's degree in Adult Education from Jones International University. Ramona is also a graduate of the Kentucky Certified Public Managers Program.

Josh Davies
Chief Executive Officer
Center for Work Ethic Development

Josh Davies is passionate about helping others make a difference in their lives, jobs, and community. Through his work as a speaker and trainer, he has engaged and encouraged professionals across North America, the Middle East, and Asia. An in-demand speaker, Josh gives keynote presentations and workshops to dozens of education, workforce, and corporate events annually. In preparation for the 2008 Democratic National Convention, he led the training for all 10,000 volunteers and more than 4,000 local service professionals for the event. *Training Magazine* named him as one of the top 10 trainers under 40 in America and the *Denver Business Journal* tapped him as one of Denver's 40 Under 40.

Davies is currently the CEO of The Center for Work Ethic Development, an organization committed to developing workplace skills in the global workforce. Partnering with organizations in 47 states and 8 countries, they equip trainers to build the workforce of the 21st Century. An avid runner, Josh has been awarded the Mile High Energy Award by Visit Denver, and an honorary Doctorate of Foodservice by the North American Food Equipment Manufacturers Association for his contributions to the industry. He has been appointed by the Governor to serve a second term on the Executive Board of the Colorado Workforce Development Council, and to Chair the State Education and Training Steering Committee. He also chairs the P-Tech Selection Committee for Colorado, and serves on the board of the Colorado Opportunity Scholarship Initiative. Josh previously served on the Board of Directors for the National Association of Workforce Development Professionals, was President of the Council of Hotel and Restaurant Trainers (CHART), and co-chaired the Colorado State Youth Council.

Brenda Demic
Kentucky Education and Workforce Development Cabinet
Registered Apprenticeship Program

Brenda Demic has always had a passion for figuring out how things work, finding solutions to problems, and incorporating the phrase "work smarter, not harder" into her own life as well as the lives of others. This, combined with her natural desire to help people, serves her well in her position as Program Coordinator for the Kentucky Education & Workforce Development Cabinet, Division of Apprenticeship. She shares the goal of Kentucky's Governor and Education & Workforce Development Cabinet Secretary to help grow the skilled workforce through Registered Apprenticeships.

Brenda's previous 25-year career with Stanley Black & Decker working as a Service Center Coordinator has provided her with an extensive background in the construction and tools industry, and has proven beneficial in the building of Registered Apprenticeship Programs in manufacturing and the skilled trades.

Dr. Diana Elliott
Senior Research Associate
Urban Institute

Diana Elliott is a senior research associate in the Center on Labor, Human Services, and Population at the Urban Institute. Her work focuses on families' financial security and economic mobility, and the programs and policies that support them, including housing affordability, apprenticeships, and financial empowerment. She was previously research manager of the Pew Charitable Trusts' work on financial security and economic mobility, where she was instrumental in fielding a major national survey on American family finances, and publishing numerous reports and briefs about the state of financial well-being and economic mobility in the United States. Before joining Pew, Elliott was a family demographer in the fertility and family statistics branch in the Social, Economic, and Housing Statistics Division at the US Census Bureau. Elliott holds a PhD in sociology from the University of Maryland, College Park.

Allyson Foster
Cabinet for Health and Family Services
Department of Community Based Services

Allyson P. Foster, Lexington, KY, came to work with the Department for Community Based Services as an Executive Advisor in March 2017. In her 18 months with DCBS Allyson has lead several efforts for Kentucky HEALTH implementation, DCBS Reorganization, and most notably established the first two Human Service Apprenticeships in the nation to accommodate growing workforce needs within DCBS.

Allyson comes from the healthcare industry, most recently with Catholic Health Initiatives, KentuckyOne Health, Inc. While working with Catholic Health, Allyson took an active role in working with their Foundations, which service healthcare needs for the indigent and underserved populations within Kentucky.

Allyson achieved her Master's degrees in Business Administration and Public Administration with intent to serve her community as a career. She has served on many non-profit boards in various locations statewide focusing on publicizing their efforts to the mass population. In her most recent role with KentuckyOne, Allyson worked on process design and implementation for investigational programs and devices, strategic design, and change management. She also has extensive experience in contract negotiation and implementation.

Allyson moved to Kentucky to attend the University of Kentucky from West Virginia. Growing up in Appalachia, she developed a passion for the people and culture in the region and decided to make Kentucky her home.

Brian Hiles
Assistant Director
Division of Field Services
Commonwealth Office of Technology

Brian Hiles serves as the Assistant Director within the Division of Field Services for the Commonwealth Office of Technology(COT). Brian brings more than 20 plus years of IT experience to his role at COT. Brian started his career at Lexmark International as a technical support specialist. Since joining the Commonwealth in 2001, Brian has served in various technical and leadership roles. Most notably, in 2013, as part of the Commonwealth's IT Infrastructure Initiative(I.3), the consolidation of Infrastructure within the Commonwealth of Kentucky, Brian served as the Desktop Services Implementation lead to help align client computing service delivery and resource allocation for newly consolidated Executive Branch agencies in Kentucky State Government. As Assistant Director, Brian has 5 direct report managers and 170 staff members throughout 120 counties of Kentucky supporting the client computing needs of Executive Branch agencies. His teams support and manage over 36,000 computers for the Commonwealth.

Brian resides in Frankfort with his wife, Stacey, and 9 year old daughter, Addison. In Brian's free time, he most enjoys the time he has with family and friends. Brian's biggest hobby is golfing, he enjoys the competiveness, fellowship, and all the life lessons golf brings.

Diana Jarboe
Kentucky Education and Workforce Development Cabinet
Division of Apprenticeship

Diana Jarboe has been part of the Division of Apprenticeship as a Program Coordinator since 2016. In this role, Diana provides technical assistance to current Registered Apprenticeship programs, serves as a liaison to the federal Department of Labor, and recruits new program sponsors and partners. She prides herself in helping KY employers fulfill their workforce needs while creating career pathways for her fellow state citizens.

Prior to working with the Education and Workforce Cabinet, Diana began her career with the Commonwealth of KY as a Licensing Board Administrator with the Public Protection Cabinet after having worked 11 years in the healthcare field as a Medical Assistant and a Medical Office Coordinator. Her experience in healthcare played a key part in building and registering some of the first healthcare apprenticeships in Kentucky.

Charla Long, J.D.
Executive Director
Competency-Based Education Network

Long is the Executive Director for the Competency-Based Education Network, a national consortium of higher education institutions and statewide systems seeking to design, develop, and scale new models of student learning. Additionally, she leads C-BEN's Consulting Services, which is dedicated to helping institutions with competency-based learning. In 2016, Long was recognized by *The Chronicle of Higher Education* as one of the Top 10 Most Influential People in Higher Education for her work in competency-based education. During 2015, she served as a consultant to Public Agenda on two significant CBE national landscape and field-building projects, funded by both the Bill & Melinda Gates Foundation and Lumina Foundation. In this role, she provided insights, tools, and support to individuals and institutions seeking to advance competency-based education in the United States. These tools included the CBE Ecosystem Framework, the Shared Design Elements and Emerging Practices Model and Research Report, and the CBExchange conference where hundreds of institutions learned how to build high-quality CBE programs. Prior to this, Long was the founding dean of the College of Professional Studies at Lipscomb University and the creator of their nationally acclaimed competency-based education (CBE) model and badging ecosystem. Long has over 20 years of higher education experience at both public and private institutions in the United States.

Greg McCall
Special Assistant
Commonwealth Office of Technology

Greg McCall serves the Commonwealth Office of Technology (COT), focusing on matters of IT strategy, policy, organization, financials and operations. The COT is the single organization responsible for IT oversight and spending within the executive branch of Kentucky state government. With responsibilities in all 120 counties, the IT footprint is vast. Reporting directly to the Commonwealth's Chief Information Officer (CIO), he continually assesses IT operations to ensure financial viability, service provision and appropriate organizational alignment. Greg has 35 years of IT experience in both the public and private sector. He came to state government after working in IT, both domestically and internationally, for more than a decade. This included time with Burroughs Corporation (later Unisys) and private consulting before coming to state government over 20 years ago. Greg has worked with transformative IT initiatives inside state government over the years, including two IT infrastructure consolidation efforts inside the executive branch. Greg and his wife Tammy have been married for 35 years and live in Lawrenceburg, Kentucky, along with their two grown daughters and their families. Away from work, he interests include his two grandchildren and travelling.

Barbara R. Murray
Executive Director
TransPORTs &
USDOL Subject Matter Expert

Barbara R. Murray is the Executive Director and Subject Matter Expert for TransPORTs, a U.S. Department of Labor national industry partner tasked with expanding apprenticeship for ports, marine manufacturers and multimodal transportation, distribution and logistics (TDL) industry employers and intermediaries nationwide.

As TransPORTs Executive Director Barbara oversees the vision and direction for her team's work to implement a 5-year, $7 million contract with a goal of helping industry employers form and expand sustainable apprenticeship programs registering thousands of apprentices. Apprenticeship is currently underutilized by multimodal TDL employers as a proven workforce development pathway for middle skilled TDL technicians across a wide variety of skilled trade and professional occupations.

Tracy Osborne Clay
Kentucky Education and Workforce Development Cabinet
Registered Apprenitceship Program

Tracy Osborne Clay is a Program Coordinator with Kentucky's Division of Apprenticeship. She provides technical support to employers within the Commonwealth of Kentucky. Specifically, helping create solutions to workforce needs by connecting employers to various partners including the local Workforce Investment Boards, Economic Development representatives, and education providers. Tracy recommends solutions for workforce needs by Registering Apprenticeship programs. Prior to working at the Kentucky Labor Cabinet, she was a Program Consultant with the Kentucky's State Approving Agency for Veteran's Education & Training. As a Program Consultant there, she was responsible for approving and monitoring educational/vocational programs for veterans to utilize GI Bill benefits. Tracy has also been a Quality Coordinator with the University of Kentucky's KIDS NOW Campaign, promoting high quality standards for early childcare providers and she was a Developmental Interventionist with Kentucky's First Steps Program, serving children with developmental delays and disabilities. Having extensive experience in education and veteran's benefits makes Tracy an all-around great resource for employers seeking the apprenticeship model.

Derrick K. Ramsey
Secretary
Education and Workforce Development Cabinet

Secretary Derrick Ramsey has decades of experience working in Kentucky's higher education system. He began his career as a Community Relations Officer at the University of Kentucky before becoming Athletic Director at Kentucky State University, where he developed the Student Athlete Excellence in Academics program. Under his leadership, Kentucky State athletics produced more Presidential Scholars than any other school department. Secretary Ramsey also served for seven years as the Director of Athletics for Coppin State University in Baltimore.

Most recently, Ramsey served as the Secretary of the Labor Cabinet under Gov. Bevin, where he was responsible for administering worker compensation and workplace standard laws for 1.9 million Kentucky workers and employers. Ramsey also served as Deputy Secretary of Commerce under former Gov. Ernie Fletcher, where he managed a $50 million budget and oversaw human resources for the agency.

As Labor Secretary, Ramsey emphasized workplace safety education and helped to streamline and modernize the state's litigation management system for workers' claims. Ramsey also revived Kentucky's Registered Apprenticeship Program to better recruit and train the next generation of workers. Over 1,000 Kentucky employers have joined the program, which offers paid on-the-job training for participants.

Ramsey is also an accomplished athlete and was the first African-American starting quarterback for the University of Kentucky football team. His athletic abilities vaulted him to a nine-year career in the NFL, which included a Super Bowl championship in 1981.

Andrew Sezonov
WPC Group Apprentices Australia

Andrew is an education into employment specialist, with over two decades experience designing and implementing dynamic vocational training and workforce development programs.

Partnering with educators and employers, Andrew has devised numerous successful programs to provide young people with access to apprenticeships and traineeships
Andrew is currently the General Manager of WPC Group, Australia's leading apprentice and trainee employer, which directly employs over 650 people, and enjoys employee retention rates 30-40% above the industry average in many sectors.

He is currently working with a team that facilitates the Australian Government's Pathways in Technology (P-TECH) pilot program, and he has been an expert advisor and lead consultant on numerous projects involving leading Australian corporates, Fortune 500 companies, as well as Governments in Australia and the USA.

Andrew has studied at the Harvard Kennedy School of Government and is a regular conference presenter. He was a keynote presenter at the 2017 International Network on Innovative Apprenticeship on the success factors of German industrial firms implementing apprenticeship programs in the US.

Andrew is passionate about skilling up the next generation of young people and promoting the value and viability of vocational training pathways. He also loves spending time with his family on his farm, outside of Melbourne, Australia.

Stephen Tressler
Kentucky Education and Workforce Development Cabinet
Registered Apprenticeship Program

Steve is a retired Marine Corps and Army National Guard veteran who served the country for over 23 years, with multiple deployments and has traveled to more than 25 countries.

Steve was the recipient of the **Lifetime Volunteer Award** by the President of the United States Barack H. Obama in the spring of 2013 for volunteering more than 4000 hours in his community over the better part of two decades.

He currently serves on the Bluegrass Workforce Innovation Board and is a former member of the Pro Football Hall of Fame Board (Kentucky Chapter). Steve remains a High School and College football play-by-play man and color analyst for television and radio when he can. He is also a highly sought after event MC for charities and businesses alike.

He has a BA in Communications from the University of Kentucky and has been married to his wife beautiful Lindsay for over 10 years. They have 3 children, Kenadee, Trey and Max. The Tressler's reside in Lawrenceburg, Ky.

Anne Wetmore
H-CAP Apprenticeship/Workforce Development Subject Matter Expert
Senior Consultant

Anne Wetmore, H-CAP Apprenticeship/Workforce Development Subject Matter Expert and Senior Consultant. Prior to H-CAP, Anne was the WA State Director with the U.S. Department of Labor Office of Apprenticeship. As a Senior Consultant with H-CAP, she provides assistance to Employers, Associations, Unions, Community Based Organizations/Non-Profits, Education, and Native American Tribes on workforce issues, especially developing new apprenticeship and other training programs for employers to "grow their own workforce" and employees to have a career ladder through on the job learning and related classroom instruction. This is done collaboratively with partners to create the best holistic training that works for both employer and employee.

The Healthcare Career Advancement Program (H-CAP) is a national labor/management organization that promotes innovation and quality in healthcare career education. H-CAP also works with joint labor/management training funds and organizations that implement local workforce, career ladder, and educational programs. In 2014, they launched the H-CAP Education Association, a 501 (c) (3) not-for-profit organization to support staff development, shared curricula, program ideas, and successful practices among the more than 14 different regional and industry based funds in the acute, ambulatory, long term and home care sectors

Nicholas Wyman
CEO
Institute for Workplace Skills and Innovation

Nicholas Wyman is an apprenticeship expert and CEO of the Institute for Workplace Skills and Innovation. He advises and develops programs for companies such as Nissan, Mercedes Benz, Citibank and Coke Cola on how to recruit, train, retain and "reskill" employees. A hands-on leader in the field, Wyman is dedicated to closing the gap between education and employment around the world. In addition to his consulting work, Wyman speaks to HR departments, trade associations, think tanks, high schools and colleges throughout the EU, Singapore, China, Australia, and the U.S. An engaging and animated speaker, Wyman shares front line stories that audiences can relate to and apply directly to their lives. He has spoken at the International Foundation Conference on Youth Philanthropy in Athens, Greece; the Global Lessons in Apprenticeships launch in Washington, D.C.; the Recharging the Youth Conference in New York, N.Y.; and several private corporate events in the U.S. and Australia. Wyman is a regular media commentator whose articles have appeared in various industry journals. He began his career as an apprentice chef and holds an MBA. He studied at the Harvard Business School and the Harvard Kennedy School. Job U, was published in January 2015 and is a practical roadmap exploring the myriad of unconventional and affordable pathways to fulfilling and rewarding careers. Debunking the notion that a traditional college degree is the best or only path to wealth and success, his book is for anyone who wants to learn how to add value and be valued in tomorrow's economy. Job U has just been awarded a 2015 International Book Award in Business Careers.

Apprenticeship Consultant

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Dr. Robert I. Lerman
Institute Fellow, Urban Institute

Robert Lerman is an Institute fellow in the Center on Labor, Human Services, and Population at the Urban Institute as well as professor of economics at American University and a research fellow at IZA in Bonn, Germany. A leading expert on apprenticeship, he recently established the American Institute for Innovative Apprenticeship. His current research focus is on skills, employer training, apprenticeship programs in the United States and abroad, and housing policies.

Lerman's published research covers employment issues, earnings and income inequality, family structure, income support, and youth development, especially as they affect low-income populations. In the 1970s, he worked as staff economist for both the Congressional Joint Economic Committee and the US Department of Labor. He was one of the first scholars to examine the patterns and economic determinants of unwed fatherhood, and to propose a youth apprenticeship strategy in the United States.

He served on the National Academy of Sciences panel on the US postsecondary education and training system, and on the Maryland Task Force on Economic Development and Apprenticeship. Lerman has testified before congressional committees on youth apprenticeship, child support policies, and the information technology labor market.

Lerman earned his AB at Brandeis University and his PhD in economics at the Massachusetts Institute of Technology.

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Plenary Sessions

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The Workplace Revolution

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Standards

for Apprenticeship

URBAN INSTITUTE · ELEVATE · THE · DEBATE

The Competency-Based Occupational Frameworks for Registered Apprenticeship Project

This project has been funded, either wholly or in part, with Federal funds from the Department of Labor, Employment and Training Administration under Contract Number DOL-ETA-15-C-0087. The contents of this publication do not necessarily reflect the views or policies of the Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement of the same by the U.S. Government.

Project Background

In cooperation with the U.S. Department of Labor's Office of Apprenticeship (OA), the Urban Institute and its partners have been building national frameworks for Registered Apprenticeships in a wide array of occupations. They provide a readymade framework for a variety of occupations and apprenticeships that employers and others can use to fast-track the development of a registered apprenticeship. Unlike existing approaches to registering programs, these frameworks are not linked to any one employer or group of employers. They are not proprietary and are available as a tool to all.

Among the benefits of these competency-based occupational frameworks include:

1) The frameworks provide work process schedules and core job functions and competencies that any employer can download from the website and use as a basis for their own registered apprenticeship. They all share a common format and template.
2) The frameworks are competency-based rather than time-based, meaning that *abilities* are important rather than the number of hours spent on tasks or memorized knowledge and skills.
3) The frameworks are consensus-based meaning that we draft them in consultation with those in the industry and vet near-final drafts with several employers in the field to ensure they reflect practice. But, they allow flexibility so individual employers can add skills, knowledge, and behaviors that are specific to their own work processes, policies, and procedures.

The Current Standing of the Project

At present, we have 10 competency-based frameworks that have been released and posted to the OA's (https://www.dol.gov/apprenticeship/) and Urban's websites (https://www.urban.org/policy-centers/center-labor-human-services-and-population/projects/competency-based-occupational-frameworks-registered-apprenticeships.) Another 8 will be released in the fall of 2018.

	Released	Soon to be released
HEALTH CARE		
Community Health Worker	X	
Medical Assistant	X	
Medical Records and Health Information Technicians and Medical Coders	X	
Sterile Supply Technician	X	
Surgical Technologist		X
IT		
Cybersecurity Support Technician	X	
Database/Cloud Administrator		X
Developer		X

IT Generalist	X	
ADVANCED MANUFACTURING		
CNC Set Up Programmer		X
Industrial Maintenance Technician		X
Industrial Manufacturing Technician		X
Mechatronics Installer		X
Mechatronics Technician		X
ENERGY		
Transmission Line Worker	X	
TRANSPORTATION		
Heavy and Tractor Trailer Driver	X	
Transit Bus Technician	X	
Transit Coach Operator	X	

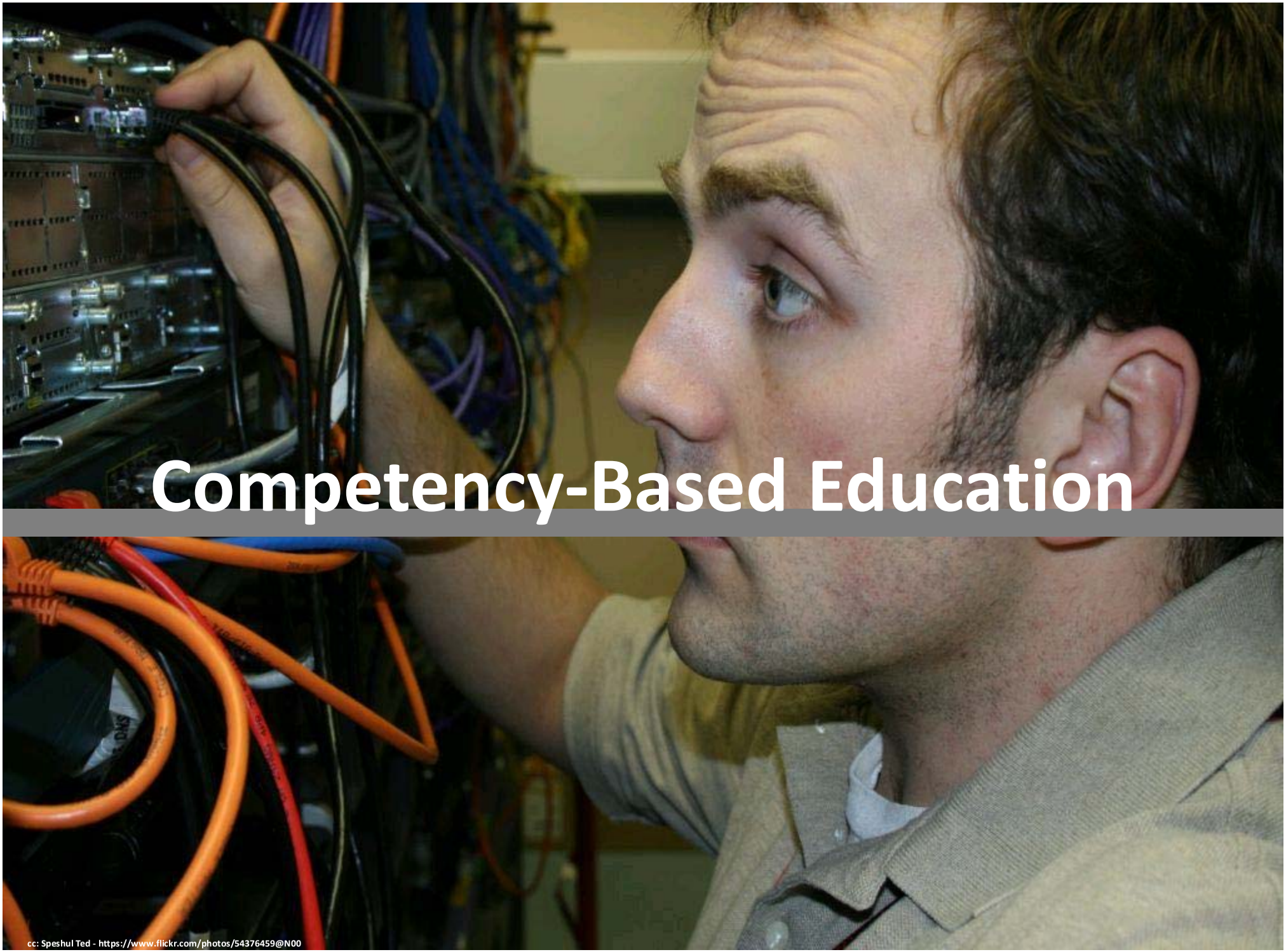
The frameworks are already being used by employers and partner organizations who are developing apprenticeships and provide a timesaving and well-researched baseline for their work and consistency across national programs. Meanwhile, our team at Urban continues to research and draft additional frameworks for occupations in the energy, healthcare, advanced manufacturing, IT, and finance sectors, among others. The goals of this work include producing and disseminating scores of competency-based frameworks widely, helping employers use them to launch programs, and broadening the number and scope of registered apprenticeships in this country.

Opportunities for Partnership

We are actively seeking ways to partner with organizations and networks to advance this work. This is a terrific opportunity for industries and employers to be part of a larger national conversation, to be leaders in this space, and to help craft the frameworks which will be foundational resources guiding the quality of registered apprenticeships in this country. Specific ways we are seeking help and input include:

1) Please **reach out to our team at Urban Institute** to have a phone call or one-on-one brainstorming session to discuss partnering ideas. Contact Diana Elliott, Project Director, at delliott@urban.org or leave a comment on our website.
2) Send us your **wish lists of occupations** that you know are "in-demand" in your industry for which you would like competency-based occupational frameworks developed.
3) If you are an employer or connected with an industry, please **be a reviewer for our brief 5-page work process schedules** for various occupations. This project is consensus-based and collaborative and we seek employers to vet each framework we create before they are approved and posted for public use. Consider requesting work process schedules that are being developed or having us attend a meeting that you are hosting to share the information and collect employer feedback. It will take less than an hour of your time to ensure the quality of apprenticeships being developed.
4) **Help us get the word out about these resources**. We want people to use them and to help us think about future frameworks. Check out the website. Refer others to it. Ask us questions about the frameworks and think about ways that we can present the information and spread the word.

This is an exciting time to be working on apprenticeships and we look forward to collaborating with you and others in this transformative work.


Competency-Based Education
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Innovations

School to Work Programs

Andrew Sezonov

Prepared for:
Kentucky Registered Apprenticeship Summit
Kentucky Exposition Center
September 10-12, 2018

General Manager
Institute for Workplace Skills & Innovation

'5 Resume Building Tips You Won't Get From Your Typical Career Counselor'

If you're about to finish high school, or have been out for some time but haven't quite figured out your next move, a tall stack of college brochures and student loan applications may be crowding out a wealth of other information about the myriad alternative educational options for next September. That may because your guidance counselor – like the majority of today's guidance counselors – has recommended college as your next step after high school graduation – without stopping to consider if it's the option that's best for you. Or it might be because your parents are convinced – wrongly – that a four-year degree is all that stands between you and a life of low-income, dead-end work. Or maybe it's simply because the societal myth of "college for everyone" is so pervasive, pursuing another alternative has never even occurred to you. That's a shame because with the serious financial investment a four-year college degree requires, it's a decision that should not be made lightly. And in truth there are many ways to begin building a resume and jumpstart a career without necessarily heading straight to college. A liberal arts degree is the perfect choice for some people, but if it is just a default choice because you aren't sure of what to do next, it may be a big investment that doesn't deliver on its return.

In today's job market, gaining hands-on experience is often the far better way to build a resume. Moreover, work experience can also inform career decisions so that if you do decide to continue with school, you have a better sense of exactly what path you want to pursue, ensuring that no investment made in your education is wasted.

Transferable workplace skills like problem-solving, team-building and critical thinking are a huge commodity in today's job market. Here are some ways to get these skills and build up a great resume, instead of simply hitting the default button and going straight to college

1. Take a "gap year" and make the most of it

For people who know exactly why they are going to college and what they have to gain from their degree, college is a great choice. But many young people are uncertain about what they want to study, or how relevant their course of study might actually be in the job market. In this case, taking a year off school to explore other opportunities can be invaluable. The key is using the gap year to gain self-knowledge, as well as some practical experience.

Use this time to try out different things. Travel if possible, but see if you can do more than just go backpacking. There are numerous opportunities to do volunteer work overseas, building houses or libraries, working with children, cultivating land, language tutoring—you name it. Many apprenticeships and traineeships offer these kinds of opportunities as well, along with a paycheck. Structured travel is a great way to not only build confidence, but all the soft skills that come with working in a professional environment as well.

2. Follow your passions, not just a paycheck

For some, the gap year might turn into three or four years, or more. A life-changing apprenticeship could lead to rewarding work in a particular field for several years before deciding to pursue a degree, as it did for me. It's important to see one's career as constantly evolving, and take advantage of the many opportunities to acquire stackable credentials. By choosing opportunities that genuinely reflect your interests, you'll add experience, knowledge and skills to your resume naturally.

3. Pursue online courses and certifications

Offered at many local community colleges, these can be an inexpensive way to explore an interest without making a huge commitment. Many are offered evenings and weekends, so you can work and earn a living while gaining practical skills to add to your resume.

4. Try out an entry-level jobs related to your field

Often, a year or two of experience on the ground floor of a career or field can be a huge competitive advantage – and accelerate your ascension up the ladder. For someone interested in hospitality or customer relations, a job in a restaurant or café would be a great place to start. For someone with an affinity for architecture or design, work on a construction or painting crew would make more sense. Seek out entry-level job opportunities in your field of interest and use the experience as a springboard.

5. Take your online reputation seriously

In a world where technology has increased our ability to connect and be visible, the use of online platforms can work to our advantage… or disadvantage. Every day, we are building or damaging our online reputation. Hiring managers and employers will notice, so it's important to be deliberate with the use of Facebook, Twitter, LinkedIn and other platforms. Consider them part of your resume, and be as careful to manage the image they project.

These platforms can also be a big help in building a network of potential employers or clients. Create a sharp, well-written LinkedIn profile that demonstrates your practical, real world skills and experience, and update it regularly. Be sure to list all your specific unique skills and abilities –whether they be a certification in mixology, the knowledge of HTML or a programming language, or the ability to wire a circuit board – not just your work history or educational experience. And remember that thoughtful, diligent network building with other skilled professionals can lead to job opportunities you might not hear of otherwise.

Andrew Sezonov

Prepared for:
Kentucky Registered Apprenticeship Summit
Kentucky Exposition Center
September 10-12, 2018

General Manager
Institute for Workplace Skills & Innovation

'3 Reasons to Invest in Skills-Based Mentoring'

At any given time, my organization represents 600 to 700 apprentices in mentored skills based programs. It's been personally rewarding to witness just how empowering mentorship can be for trainees, mentors, and companies alike. 82% of apprentices in our programs complete trade certifications and go on to earn progressive wage increases and promotions within the companies that trained them. Mentorship is a cornerstone of these programs and a big factor in their success.

Why is this so important now?

As Baby Boomers reach retirement age, many industries are facing a loss of skilled workers. At the same time, the pace of technological change demands that today's workers acquire new skills rapidly and continue to upgrade their skills while on the job.

Rather than waiting, possibly in vain, for a job-ready candidate to walk through the door, employers can recruit promising talent and build up candidates' skills with on-site training and professional development.

Mentoring is an important part of a successful skill building program. As a management tool, it is one of the most effective ways to transfer organizational knowledge as well as job-specific skills. Unlike more traditional supervisory management, mentoring creates a climate of support, guidance, and teaching that boosts employee engagement and productivity.

What's in it for employers?

1. A better bottom line.

Many employers have already seen that focusing on training and workforce development reduces costs and increases their bottom line. Apprenticeships, for example, offer a 38% return on investment by lowering recruitment costs and reducing the need to hire contractors.[1] But the gains of a mentoring program don't stop there. Effective training and mentoring also improves workforce productivity that drives output and makes businesses more competitive.

A seven-year study [2] conducted at Sun Microsystems showed significant differences in retention and output between mentored and non-mentored staff, as well as those who served as mentors. Retention rates were 72% for mentees and 69% for mentors, compared with only 49% for those who did not participate in the program. Improved retention resulted in a $6.7 million dollar savings in turnover and replacement costs. Only 5% of non-participants saw a positive change in salary grade, while 25% of mentees and 28% of mentors did. The company noted that because salary increases indicate a greater contribution to the organization's impact, the compensation gains of mentors and mentees also represent a positive return for the company.

2. Increased employee engagement.

Mentees benefit from the knowledge and experience of veteran workers, and are better prepared to meet the challenges they will find on the job. At the same time, the personal approach of mentoring creates a sense of relevance and being 'a part of' the organization. Research shows that employees who feel a sense of belonging within the organization have much greater engagement. [3] Mentored employees reach out for opportunities for growth and personal career development. They are more likely to become self-starters, often motivated by the knowledge that their efforts are recognized and relevant. Such employees in turn contribute more to the organization. Mentorship creates a culture of collaboration. Both mentors and mentees benefit from the sense of shared investment and personal accountability. As one mechatronics apprentice said recently, "You get to make your voice matter."

3. The next generation of workers prefers mentoring to management.

Mentoring is a proven, effective formal method of training. At the same time, it is an informal method of connecting with and educating the next generation of workers. Research shows that mentorship is more appealing than management for the Millennial Generation, people now in their 20s and early 30s, who will make up 40% of the workforce by 2020. According to data gathered by the Intelligence Group (publishers of the youth-focused research quarterly Cassandra Report), 88% of Millennials prefer a collaborative work culture to a competitive one, and 79% would prefer that their managers serve as mentors rather than bosses. [4]

Mentorship is an effective training tool for workers of any age. But these numbers also indicate that it's going to be the preferred approach for the next generation. To attract the best talent of today and tomorrow, I believe smart employers

will increasingly integrate mentorship into their organizations. Skills building programs, such as apprenticeships, are an excellent way to formalize mentoring.

A few things to keep in mind:

Mentoring is most effective when it is integrated into the organizational structure.

It's important to set clear expectations and benchmarks.

Establish clear methods of evaluation to address skill gaps, strengths and weaknesses.

Compatibility and confidentiality between mentor and mentee is key to success. Mentors should be carefully selected and have strong organizational support in their new role.

Kentucky Leadership

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Lunch

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Competency-Based Education

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Apprentices in State Government

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Apprenticeship

THE EMPLOYER ADVANTAGE

Building Skills. Building Confidence. Building the Future.

Recruiting, training, and retaining talent is the most important thing employers do. The apprenticeship model allows employers to take charge of building their own pipeline of highly-skilled and highly-motivated workers.

Apprenticeship offers a flexible training solution aligned with national industry standards and your company-specific standards. You get the benefit of a well-skilled, well-rounded worker ready for a professional career in your company.

The 21st century apprenticeship model: structured, sustainable training that combines learning with doing.

If you have positions with high turnover, an aging, but skilled workforce, or are facing the challenge of helping your workers keep up with industry changes, apprenticeship is the solution. You'll see the impact where it matters most… your bottom line: higher productivity, lower turnover, less recruitment costs, and increased workplace safety.

fact

Over 150,000 businesses have integrated the apprenticeship model into their talent development strategy.

"With our **apprenticeship** program partners, **Hypertherm has educated and apprenticed over 450 CNC machine operators in the past 7 years,** allowing us to keep our manufacturing facilities within the United States."

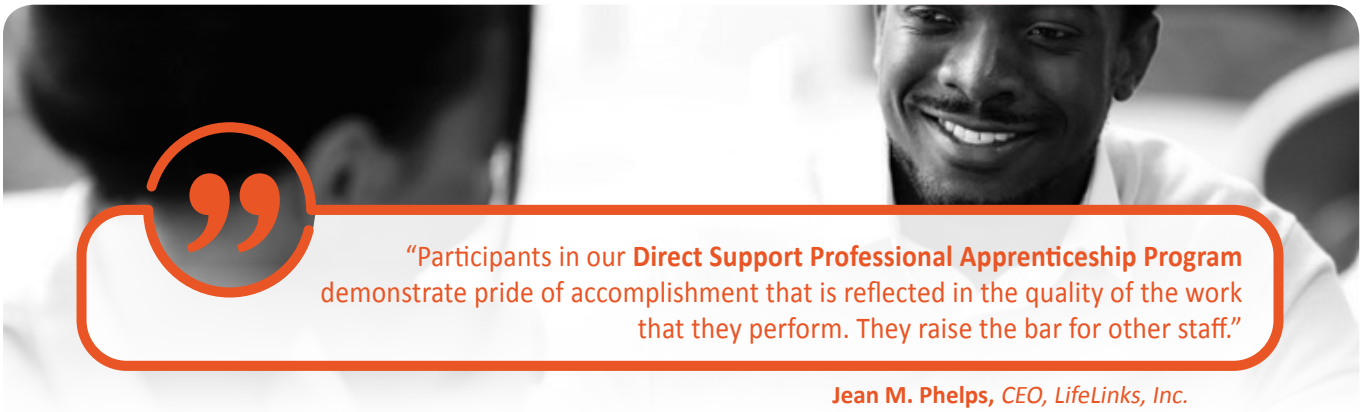
Matthew Burge, *Hypertherm Technical Training Institute*

Design a program that works for you.

Apprenticeship can be customized to meet the needs of every business. You can choose a time-based program where workers complete a specific number of hours, or a competency-based program, where workers demonstrate skills through proficiency testing. Or choose a hybrid program with the best of both models.

fact

A survey of businesses with apprenticeship programs found that 97% would recommend apprenticeship to others.



"Participants in our **Direct Support Professional Apprenticeship Program** demonstrate pride of accomplishment that is reflected in the quality of the work that they perform. They raise the bar for other staff."

Jean M. Phelps, *CEO, LifeLinks, Inc.*

Productive from Day One, & more likely to stay on the job.

Train new workers or upgrade the skills of your current workforce. As employees retire, are promoted or reassigned, you'll be creating career paths for the next generation of skilled workers.

fact

Studies show the average retention for apprentices completing programs is 91%.

Apprenticeship THE EMPLOYER ADVANTAGE

"As a cutting-edge IT services provider, we are challenged with finding qualified talent in our area. Through our **Internetworking Associate Apprenticeship,** we designed a program that trains entry-level technicians in our niche technology field. We have had incredible success with this program and see it as an integral business mechanism for hiring talent and training them the Atrion way."

Rachel Croce, *Atrion Networking Corp.*

Not just for skilled trades.

Nationwide, there are apprenticeship programs in more than 1,000 occupations, including jobs in health care, energy, information technology, transportation, and advanced manufacturing, as well as the building trades.

fact

There are over 550,000 apprenticeships across the country.

Your company may qualify for tax credits.

Many states offer tax credits related to apprenticeship programs. Employers may also be able to claim training expenses as a federal tax credit.

Your workers also benefit.

Apprentices receive a paycheck from day one that is guaranteed to increase as their training, knowledge, and skills progress – rewarding high-performing employees and moving them up the career ladder in your business. Workers who complete an apprenticeship program earn a credential equivalent to a 2- or 4-year college degree.

READY TO GET STARTED?

Join companies nationwide who have used apprenticeship to develop a highly-skilled workforce with increased productivity, higher morale, and lower turnover.

For more information on apprenticeship, visit http://www.dol.gov/apprenticeship/employers.htm

Name

Organization

Phone

Email

Your local workforce system is your training and recruiting partner. Call or click today.

Website

Creating Opportunities

Helping People

Strengthening Kentucky

Application Process

Complete application
and submit by September 15 to

Apprenticeship Program Coordinator:
Ramona.Brock@ky.gov

or

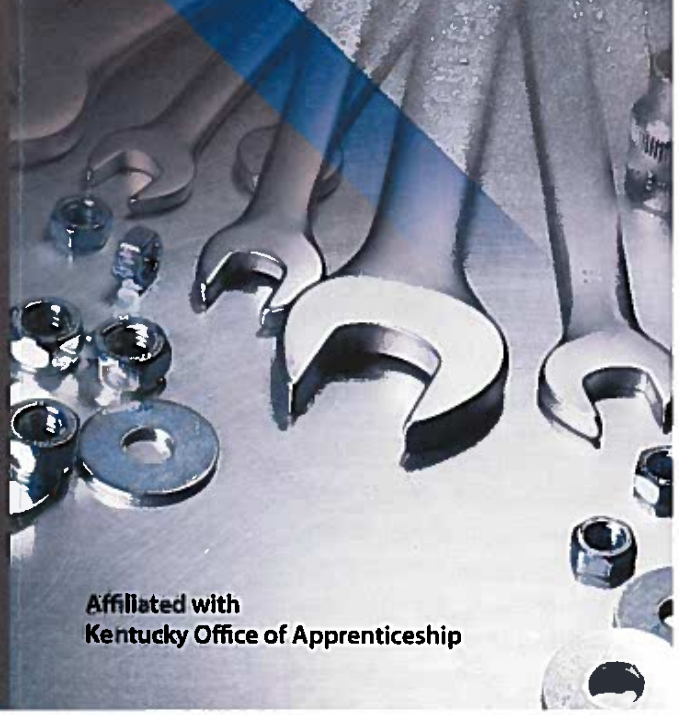
Kentucky Transportation Cabinet
Apprenticeship Program Coordinator
State Highway Engineer's Office
200 Mero Street, 6th Floor East
Frankfort, KY 40622

KENTUCKY TRANSPORTATION CABINET

TRANSPORTATION TMAP Mechanic Apprenticeship Program

33

Transportation Mechanic Apprenticeship Program



Affiliated with
Kentucky Office of Apprenticeship

EARN as you LEARN!

"For young persons just starting out in the world of work, apprenticeship has important advantages. It offers an efficient way to learn skills, for the training is planned and organized and is not hit-or-miss."

U.S. Department of Labor

Qualifications

- 18 years or older
- Valid driver's license
- Acceptable Criminal Record Report
- First year student enrolled in an Automotive or Diesel Technology Program through KCTCS

Why TMAP?

Gain practical hands-on experience with pay at the local Department of Highways while enrolled in an Automotive or Diesel Technology Program through the Kentucky Community and Technical College System (KCTCS).

Earn a nationally recognized credential as an "Automotive Technician Specialist Apprentice" in addition to a college degree. The Transportation Mechanic Apprenticeship Program meets national standards for registration with the U.S. Department of Labor and the Kentucky Office of Apprenticeship. Learn more about the Apprenticeship Program at labor.ky.gov.

Program Requirements

- Two-year program (2000 hours combined schooling and work experience)
- Four-month probation
- Satisfactory work ethic
- Willingness to learn and take direction

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ApprenticeshipUSA

Registered Apprenticeships Frequently Asked Questions

What is Registered Apprenticeship?

Registered Apprenticeship is an "earn while you learn" model that combines employer-based, on-the- job training, with job-related classroom and/or online instruction. Together, this combined instruction prepares apprentices, who are paid employees receiving wage increases as their skills increase, to achieve a nationally recognized certificate of competency and achievement upon program completion.

What are the basic program components of Registered Apprenticeship?

Employer Involvement
As the foundation of every apprenticeship program, employers help to shape and build the program, remaining involved every step of the way.

Structured On-the- Job Learning (OJL)
Apprenticeships include a work-based learning component with support from a preceptor/mentor who is fully competent in the occupation. The training is based on national industry standards, customized to the needs of the particular employer.

Related Technical Instruction (RTI)
RTI covers the technical and academic knowledge base that applies to the occupation. Depending on the type of apprenticeship, RTI can be delivered by the employer, union-based trainers or by an education partner including Community Colleges and Universities.

Rewards for Skill Gains
Apprentices receive increased earnings tied to an increase in skills and competencies.

Recognized Credential
Apprentices gain a nationally recognized, portable credential upon completion, which signifies to employers that apprentices are fully qualified for the job.

Is a Registered Apprenticeship a job?

Yes, apprentices start working from day one with at least one wage increase as they become more proficient in the occupation.

How long are Registered Apprenticeship programs?

Apprenticeships typically last a year or more, depending on the skills and knowledge required for mastery of a particular occupation. Credit for prior experience and/or learning can be granted. However, at least 6 months of On-the-Job Learning experience is required.

What are examples of occupations that have a Registered Apprenticeship in healthcare?

Over 40 Registered Apprenticeship programs have been approved for healthcare occupations, examples of which include:

- **Medical/Hospital Coder**
- **Community Health Worker**
- **Medical Assistant**
- **Behavioral Health Technician**
- **Home Care Worker/Aide**
- **Certified Nursing Assistant**

The list of healthcare occupations using Registered Apprenticeship continues to grow, as employers and their workforce partners learn about apprenticeships and develop new programs.

Why bring Registered Apprenticeships to the healthcare industry?

Healthcare is continuously evolving, as new regulations, technological advances and changing patient demographics emerge that create unique workforce challenges. Apprenticeships have demonstrated benefits for workers and employers, especially given the expansion and reorganization of healthcare services taking place.

Benefits of Apprenticeship

Earn and Learn

- Industry-recognized Credential
- Qualify for Permanent Position
- Financial Incentives
- Work-based Learning
- Classroom Instruction
- Federal Oversight

How does Registered Apprenticeship benefit current workers?

Current workers who are not participating in the apprenticeship program will retain their jobs, while gaining well-trained workers to share the workload. The holistic, team-based training approach builds morale and a collaborative work environment.

How does Registered Apprenticeship benefit the employer?

Apprenticeships help healthcare employers develop skilled employees specific to their workplace needs. Apprenticeship programs have been shown to pay for themselves and to improve companies' bottom lines by reducing turnover rates, increasing productivity and lowering recruitment costs.

Can you earn college credit while participating in a Registered Apprenticeship program?

Some apprenticeships require college credit-bearing courses (e.g., Medical/Hospital Coding). For other apprenticeable occupations (e.g., Community Health Worker or Certified Nursing Assistant), credit bearing courses may be optional.

For more information about healthcare apprenticeships, please contact Daniel Bustillo, Director, H-CAP and Director, National Center for Healthcare Apprenticeships at daniel.bustillo@hcapinc.org or (646) 463-3729

H-CAP
HEALTHCARE CAREER ADVANCEMENT PROGRAM

www.hcapinc.org
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New York, NY 10036
@HCAPinc

This project has been funded, either wholly or in part, with Federal funds from the Department of Labor, Employment and Training Administration under contract Number DOL-ETA-16-C-0095. The contents of this publication do not necessarily reflect the views or policies of the Department of Labor, nor does mention of trade names, commercial products or organizations, imply endorsement of same by the U.S. Government.

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Developing Registered Apprenticeships in Healthcare

U.S. Department of Labor National Industry Partner Contract

ApprenticeshipUSA

H-CAP Presentation For Kentucky Apprenticeship, Healthcare Employers, Workforce Development, Community Colleges and Other Partners

6/25/18

H-CAP and US DOL Contract

- **Healthcare Reform and the Workforce**
- **Registered Apprenticeship**
- **Registered Apprenticeship in Healthcare**
- **Apprenticeship Partners**
- **Technical Assistance**

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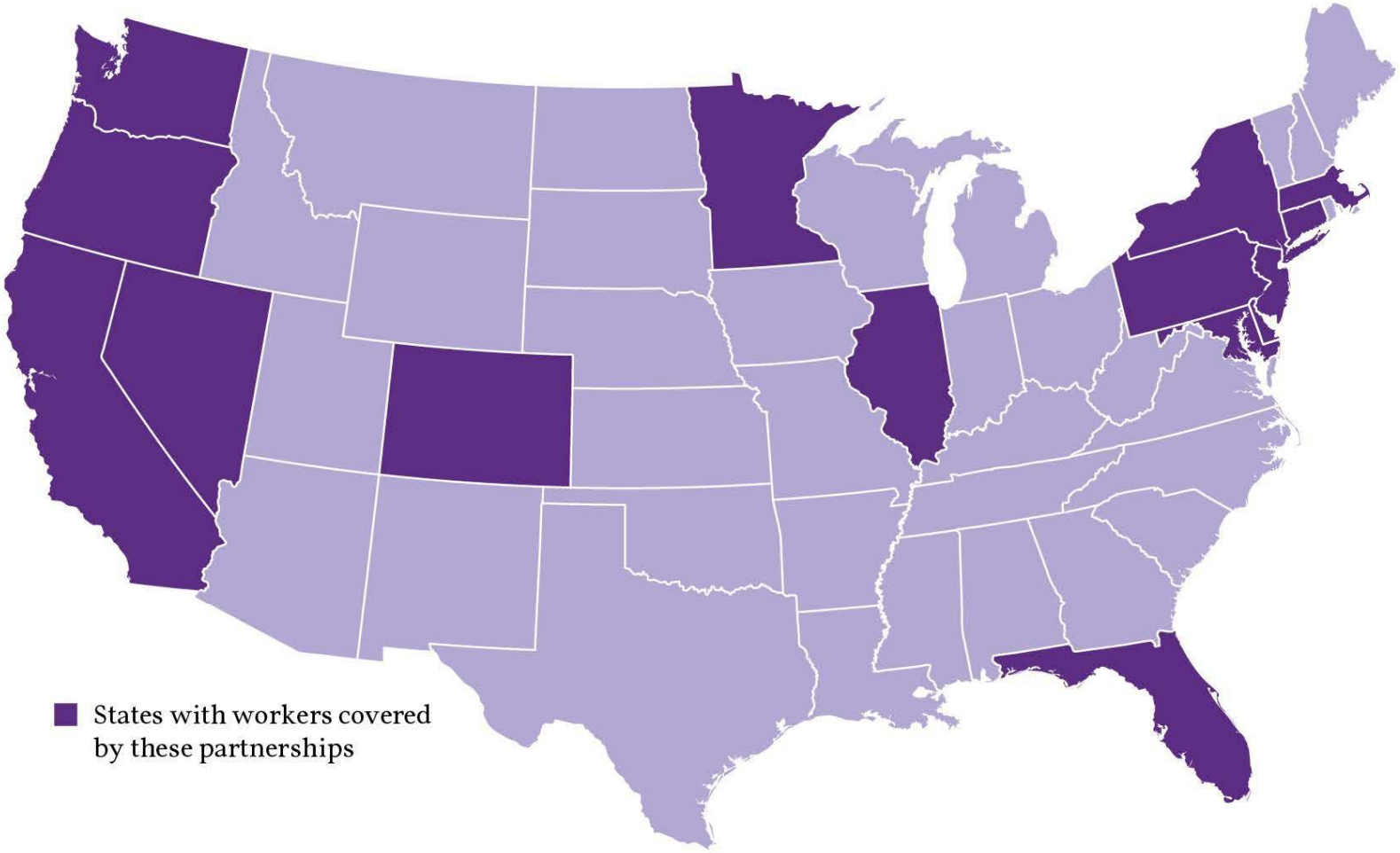
About H-CAP

H-CAP is a national labor/management organization promoting innovation and quality in healthcare career education



SEIU-AFSCME National Center for Healthcare Apprenticeships

National Joint Apprenticeship Training Committee of healthcare labor and employer representatives, administered by H-CAP

- Robust vetting and approval of new occupations
- Registered occupations
  - Community Health Worker
  - Hospital Coder
  - Home care (Support and Retention Coordinator 1 and 2)
  - Medical Assistant
  - Emergency Medical Technician

Pending Approval

Home Health Aide + Specialties (Advanced Home Health Aide, Peer Trainer, Transitional Gap Aide, Geriatric, Dementia, Hospice/Palliative Care

Surgical Tech

Central Sterile Processing Tech

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Apprenticeship Registration Support by State

- Arizona
- California
- Colorado
- Florida
- Hawaii
- Idaho
- Kentucky
- Maryland
- Massachusetts
- Mississippi
- Montana
- New Jersey
- New York
- Pennsylvania
- Rhode Island
- Washington
- West Virginia

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National Industry Partner in Healthcare: Technical Assistance Available www.hcapinc.org

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Healthcare: An Industry in Transition

- From treating illness to promoting health
- Consolidation of institutions
  - Larger systems absorb more risk and serve more patients and communities
- Projected job growth
  - Primarily at low-wage end
  - Shortage of nurses, doctors, and other primary care providers remains
- Increasing need for upgraded skills across the workforce as patient acuity increases
- Increasingly difficult to bridge the gap between low-wage and middle to higher-wage jobs

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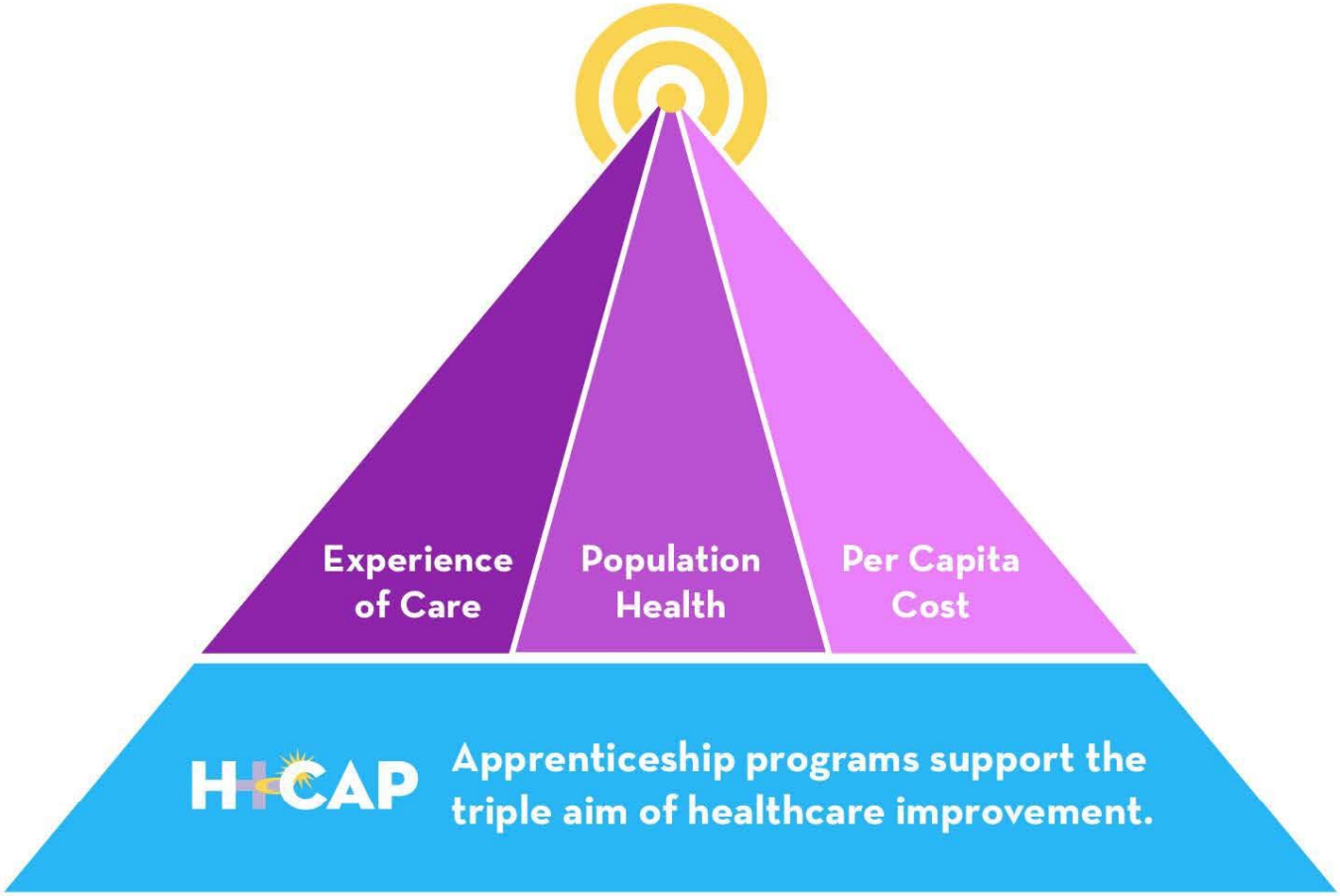
Healthcare Reform, the Workforce & Apprenticeships



Developing Healthcare Workforce to Meet System Goals

Reformed Healthcare Workforce

- New care delivery models
- Helping complex patients
  - Care transitions
  - Behavioral health
  - Accessing community services and supports
- Enhanced/advanced/specialized skills and knowledge
- New job titles and roles
- Recruiting, training, and retaining diverse workers
- Leadership training for succession planning

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Changing Healthcare Workforce Roles

Traditional Role	→	New Role
Episodic Care	→	Health and Wellness
Treatment	→	Integrated Care
Supervising Staff	→	Managing a Team
Individual Provider	→	Team-based Care
Care Provider	→	Care Manager
Paper-based	→	Technological Advances
Payment for Service	→	Payment for Service
Productivity Outcomes	→	Accountable for Quality and Outcomes
Patient Treatment Management	→	Patient Engagement and Self-management

Registered Apprenticeship 101

- Combines work-based learning and education of training a worker to become fully competent in an occupation
- Paid On-the-Job Learning under the direction of a mentor or other experienced professional in thata field
- Wages increase as the apprentice skill and production level increases
- Related instruction in classrooms or online to supplement the on-the-job learning. May earn college credit
- Approved and registered with US Department of Labor or a State Apprenticeship Agency
- Pre-Apprenticeship programs can be established to help prepare candidates for successful application com apprenticeship

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Apprenticeships in Healthcare: Workforce Solution

- Creates multiple career pathways for career advancement
- Increase workplace diversity as recruit, prepare and train various diverse populations to enter and succeed through apprenticeship
- Benefits employers, workers, and patients
- Better recruitment and retention outcomes and loyalty
- Collaborative partnership with business, labor, education, government, community organizations
- Creates opportunity to focus on competency within industry standards but with flexibility for local training needs
- Codifies and standardizes workforce competencies, evaluation and assessment across departments
- Succession planning and transfer of knowledge

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Bronx-Lebanon Hospital Center Community Health Worker Apprenticeship

They really are a quality group "who act as the eyes and the ears of the community" to bring back valuable information to primary care physicians. "We want to show that this program has a significant impact on individuals' lives and the communities we serve."

- Dr. Doug Reich, Chair, Bronx-Lebanon Department of Family Medicine

Key Program Features

- Formalized haphazard training approach
- Apprentices spend time learning in the classroom, medical setting, and the community
- Builds in guidance from experienced mentors
- Rigorous evaluation

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South Los Angeles, Los Angeles County, CA Emergency Medical Technician

- Meets industry demand for highly skilled workers
- Increases workforce diversity aligned to the patients populations served
  - From communities with high unemployment
  - Encountered economic hardship, violence, and high school dropout
- Pre-apprenticeship program provides trauma-informed care to address these barriers
- Updated apprenticeship to competency-based model and current industry practice
- Increased participation by EMT employers

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San Francisco/San Mateo Counties, CA Support and Retention Coordinator 1 and 2

- Interest in promoting home care workers into supervisory position due to labor shortage and skill needs
  - Qualified applicants lacked home care experience
  - Home care workers lacked supervisory experience
- Labor/management driven process providing union members a career pathway into a non-union position
- Expansion plans to include more apprentices and higher positions, based on pilot results

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Developing and Implementing Your Apprenticeship Program

- Point of contact and committee to resesarch the training needs of employer and if apprenticeship would be good fit
- With buy in of employer and workers, bring partners to the table to develop
- Determine occupation to develop; determine who will provide the education piece; determine on the job work processes and competencies
- Develop Standards of Apprenticeship that spell out the details of the training, with assistance from the state apprenticeship consultants and others
- Get the Apprenticeship Approved and Registered with the state or federal Labor Dept

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Implementing Your Apprenticeship continued

- Determine your recruitment plan for candidates
- Candidates screening according to the selection plan in the Standards
- Determine how OJL will be evaluated and tracked
- Determine the details of the related instruction
- Work with other workforce partners for resources to help apprentice succeed
- Select the apprentices and begin tracking progress
- Keep records of the selection and the progress of the apprentice for 5 years
- Work within all DOL requirements
- Sustainability and Continuous improvement

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Q&A

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More Innovation

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Chief Executive
Institute for Workplace Skills & Innovation

'How a Skills-Based Education Can Help Shape your Dream Career'

We all have different passions, talents, ambitions – so why are we all asked to follow the same educational path?

There is a common misconception that a traditional four-year college degree is the only logical choice for intelligent, motivated people. Yet successful careers are not handed out with college diplomas; they are built through imagination, passion, and dedication to getting the right education, at the right time. These skills and others, which can easily be acquired at community colleges or through other types of vocational training, are often the key ingredients in crafting a dream career.

Right now, there are so many exciting opportunities to re-define what a successful, rewarding, and lucrative career can look like. Far from being second-best, skills-based learning is now, more than ever, the way to make your dream career a reality: a college degree is not necessarily required. And I'm not just talking about low-paying or low-status jobs that (unfortunately) people tend to associate with community college. I'm talking about high-paying, highly technical jobs like computer programmers or medical technologists. In researching for my book JOB U, I had the privilege of connecting with a number of people who have carved out their own unique, rewarding career paths in surprising ways. The common thread was not a four-year degree or diploma; it was that they followed their passions, going where their interests led them, and gaining the necessary skills along the way.

Douglas Gorenstein, for example, enjoys a career as a top photographer in New York City, specializing in headshots (the professional photos every aspiring actor needs for auditions and publicity). A respected performance photographer with television and stage experience as well as a published author, Douglas achieved his success without ever finishing college. Instead, he followed his passion for the theatre, first as an actor, and later discovered a love of photography. Through courses at the International Center of Photography and lots of practice, Douglas acquired the technical skills to turn his passion into a thriving career. Douglas is one of many countless examples of how skills-based learning can shape a career that is just right for the individual. In fact, many of the most motivated, creative people need non-traditional pathways, and there's no reason those pathways can't start at community college.

So what can you do?

1. Discover what you love to do (without it costing a fortune).

What better way to discover what you enjoy than by trying it out? Just signing up for an online course or an introductory class at your local community college can give you an idea of what you want, or don't want, to do. And, best of all, it's much cheaper to test the waters this way than to sink thousands of dollars into a semester at an expensive university.

2. Consider different ways to learn.

For many people, the traditional structure of college—sitting in a classroom and listening to a lecture—is a difficult way to learn. There are many different learning styles, and the typical classroom format only appeals to one of them. Many of us learn better by doing, and seeing results in the real world. Others benefit greatly from having the focused attention of a mentor, which is often an aspect of apprenticeships and traineeships. Vocational training provides limitless opportunities to learn in different ways and contexts, helping build confidence as you build skills.

Using New Standards

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COMPETENCY-BASED OCCUPATIONAL FRAMEWORK FOR REGISTERED APPRENTICESHIP

[Job Title]

ONET Code:

RAPIDS Code:

Created:

Updated:

This project has been funded, either wholly or in part, with Federal funds from the Department of Labor, Employment and Training Administration under Contract Number DOL-ETA-15-C-0087. The contents of this publication do not necessarily reflect the views or policies of the Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement of the same by the U.S. Government.

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ABOUT THE URBAN INSTITUTE

The nonprofit Urban Institute is dedicated to elevating the debate on social and economic policy. For nearly five decades, Urban scholars have conducted research and offered evidence-based solutions that improve lives and strengthen communities across a rapidly urbanizing world. Their objective research helps expand opportunities for all, reduce hardship among the most vulnerable, and strengthen the effectiveness of the public sector.

Acknowledgements

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Competency-Based Occupational Frameworks

The Urban Institute, under contract by the U.S. Department of Labor, has worked with employers, subject matter experts, labor unions, trade associations, credentialing organizations and academics to develop Competency-Based Occupational Frameworks (CBOF) for Registered Apprenticeship programs. These frameworks defined the **purpose** of an occupation, the **job functions** that are carried out to fulfill that purpose, the **competencies** that enable the apprentice to execute those job functions well, and the **performance criteria** that define the specific knowledge, skills and personal attributes associated with high performance in the workplace. This organizational hierarchy – Job Purpose – Job Functions – Competencies – Performance Criteria – is designed to illustrate that performing work well requires more than just acquiring discrete knowledge elements or developing a series of manual skills. To perform a job well, the employee must be able to assimilate knowledge and skills learned in various settings, recall and apply that information to the present situation, and carry out work activities using sound professional judgement, demonstrating an appropriate attitude or disposition, and achieving a level of speed and accuracy necessary to meet the employer's business need.

The table below compares the terminology of Functional Analysis with that of traditional Occupational Task Analysis to illustrate the important similarities and differences. While both identify the key technical elements of an occupation, Functional Analysis includes the identification of behaviors, attributes and characteristics of workers necessary to meet an employer's expectations.

Framework Terminology	Traditional Task Analysis Terminology
Job Function- the work activities that are carried out to fulfill the job purpose	Job Duties- roles and responsibilities associated with an occupation
Competency- the actions an individual takes and the attitudes he/she displays to complete those activities	Task- a unit of work or set of activities needed to produce some result
Performance Criteria- the specific knowledge, skills, dispositions, attributes, speed and accuracy associated with meeting the employer's expectations	Sub Task- the independent actions taken to perform a unit of work or activity

Although designed for use in competency-based apprenticeship, these Competency-Based Occupational Frameworks also support time-based apprenticeship by defining more clearly and precisely what an apprentice is expected to learn and do during the allocated time-period.

CBOFs are comprehensive to encompass the full range of jobs that may be performed by individuals in the same occupation. As employers or sponsors develop their individual apprenticeship programs, they can extract from or add to the framework to meet their unique organizational needs.

Components of the Competency-Based Occupational Framework

Occupational Overview: This section of the framework provides a description of the occupation including its purpose, the setting in which the job is performed and unique features of the occupation.

Work Process Schedule: This section includes the job functions and competencies that would likely be included in an apprenticeship sponsor's application for registration. These frameworks provide a point of reference that has already been vetted by industry leaders so sponsors can develop new programs knowing that they will meet or exceed the consensus expectations of peers. Sponsors maintain the ability to customize their programs to meet their unique needs, but omission of a significant number of job functions or competencies should raise questions about whether or not the program has correctly identified the occupation of interest.

Cross-cutting Competencies: These competencies are common among all workers, and focus on the underlying knowledge, attitudes, personal attributes and interpersonal skills that are important regardless of the occupation. That said, while these competencies are important to all occupations, the relative importance of some versus others may change from one occupation to the next. These relative differences are illustrated in this part of the CBOF and can be used to design pre-apprenticeship programs or design effective screening tools when recruiting apprentices to the program.

Detailed Job Function Analysis: This portion of the framework includes considerable detail and is designed to support curriculum designers and trainers in developing and administering the program. There is considerable detail in this section, which may be confusing to those seeking a more succinct, higher-level view of the program. For this reason, we recommend that the Work Process Schedule be the focus of program planning activities, leaving the detailed job function analysis sections to instructional designers as they engage in their development work.

a. Related Technical Instruction: Under each job function appears a list of foundational knowledge, skills, tools and technologies that would likely be taught in the classroom to enable the apprentice's on-the-job training safety and success.

b. Performance Criteria: Under each competency, we provide recommended performance criteria that could be used to differentiate between minimally, moderately and highly competent apprentices. These performance criteria are generally skills-based rather than knowledge-based, but may also include dispositional and behavioral competencies.

Using the Competency-Based Occupational Framework to Develop a Registered Apprenticeship Program

When developing a registered apprenticeship program, the Work Process Schedule included in this CBOF provides an overview of the job functions and competencies an expert peer group deemed to be important to this occupation. The Work Process Schedule in this document can be used directly, or modified and used to describe your program content and design as part of your registration application.

When designing the curriculum to support the apprenticeship program – including on the job training and related technical instruction – the more detailed information in Section 5 could be helpful. These more detailed job function documents include recommendations for the key knowledge and skill elements that might be included in the classroom instruction designed to support a given job function, and the performance criteria provided under each competency could be helpful to trainers and mentors in evaluating apprentice performance and insuring inter-rater reliability when multiple mentors are involved.

[Job Title] Occupational Overview

Occupational Purpose and Context

[Occupational purpose and context]

Potential Job Titles

[Potential job titles]

Attitudes and Behaviors

[Attitudes and Behaviors]

Apprenticeship Prerequisites

[Apprenticeship prerequisites]

Occupational Pathways

[Occupational pathways]

Certifications, Licensure and Other Credential Requirements

CREDENTIAL	Offered By	Before, During or After Apprenticeship
[Credential 1]		
[Credential 2]		
[Credential 3]		

Job Functions

JOB FUNCTIONS	Core or Optional
1. [Job function 1]	
2. [Job function 2]	
3. [Job function 3]	
4. [Job function 4]	
5. [Job function 5]	
6. [Job function 6]	

7. [Job function 7]	
8. [Job function 8]	
9. [Job function 9]	
10. [Job function 10]	

Stackable Programs

This occupational framework is designed to link to the following additional framework(s) as part of a career laddering pathway.

STACKABLE PROGRAMS	Base or Higher Level	Stacks on top of
1. [Additional framework 1]		
2. [Additional framework 2]		
3. [Additional framework 3]		
4. [Additional framework 4]		
5. [Additional framework 5]		

Options and Specializations

The following options and specializations have been identified for this occupation. The Work Process Schedule and individual job function outlines indicate which job functions and competencies were deemed by industry advisors to be optional. Work Process Schedules for Specializations are included at the end of this document.

OPTIONS AND SPECIALIZATIONS	Option	Specialization
[Option/specialization 1]		
[Option/specialization 2]		
[Option/specialization 3]		
[Option/specialization 4]		
[Option/specialization 5]		

Levels

Industry advisors have indicated that individuals in this occupation may function at different levels, based on the nature of their work, the amount of time spent in an apprenticeship, the level of skills or knowledge mastery, the degree of independence in performing the job or supervisory/management responsibilities.

LEVEL	Distinguishing features	Added Competencies	Added Time Requirements

Work Process Schedule

Job Functions and Competencies

WORK PROCESS SCHEDULE [Job Title]		ONET Code: RAPIDS Code:
Job Title:		
Level:	**Specialization:**	
Stackable Program: ___Yes ___No **Base Occupation Name:**		
Company Contact:		
Address:	**Phone:**	**Email:**
Apprenticeship Type: ___Competency-Based ___Time-Based ___Hybrid	**Prerequisites:**	

JOB FUNCTION 1:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 2:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 3:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 4:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 5:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 6:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 7:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			

I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 8:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 9:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			
G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

JOB FUNCTION 10:			
Competencies	Core or Optional	RTI	OJT
A. [Competency A]			
B. [Competency B]			
C. [Competency C]			
D. [Competency D]			
E. [Competency E]			
F. [Competency F]			

G. [Competency G]			
H. [Competency H]			
I. [Competency I]			
J. [Competency J]			

Specialization

Type of Specialization: _____

JOB FUNCTION 1:		
Competencies	RTI	OJT

JOB FUNCTION 2:		
Competencies	RTI	OJT

JOB FUNCTION 3:		
Competencies	RTI	OJT

JOB FUNCTION 4:		
Competencies	RTI	OJT

JOB FUNCTION 5:		
Competencies	RTI	OJT

JOB FUNCTION 6:		
Competencies	RTI	OJT

JOB FUNCTION 7:		
Competencies	RTI	OJT

JOB FUNCTION 8:		
Competencies	RTI	OJT

JOB FUNCTION 9:		
Competencies	RTI	OJT

JOB FUNCTION 10:		
Competencies	RTI	OJT

Related Technical Instruction Plan

COURSE NAME	Course Number
	Hours
LEARNING OBJECTIVES	

COURSE NAME	Course Number
	Hours
LEARNING OBJECTIVES	

COURSE NAME	Course Number
	Hours
LEARNING OBJECTIVES	

COURSE NAME	Course Number
	Hours
LEARNING OBJECTIVES	

Cross-Cutting Competencies

	COMPETENCY**	0	1	2	3	4	5	6	7	8
Personal Effectiveness	Interpersonal Skills									
	Integrity									
	Professionalism									
	Initiative									
	Dependability and Reliability									
	Adaptability and Flexibility									
	Lifelong Learning									
Academic	Reading									
	Writing									
	Mathematics									
	Science & Technology									
	Communication									
	Critical and Analytical Thinking									
	Basic Computer Skills									
Workplace	Teamwork									
	Customer Focus									
	Planning and Organization									
	Creative Thinking									
	Problem Solving & Decision Making									
	Working with Tools & Technology									
	Checking, Examining & Recording									
	Business Fundamentals									
	Sustainable									
	Health & Safety									

**Cross-cutting competencies are defined in the Competency Model Clearinghouse:

https://www.careeronestop.org/CompetencyModel/competency-models/building-blocks-model.aspx

Cross-Cutting Competencies identify transferable skills – sometimes called "soft skills" or "employability skills" – that are important for workplace success, regardless of a person's occupation. Still, the relative importance of specific cross-cutting competencies differs from occupation to occupation. The Cross-Cutting Competencies table, above, provides information about which of these competencies is most important to be successful in a particular occupation. This information can be useful to employers or intermediaries in screening and selecting candidates for

apprenticeship programs, or to pre-apprenticeship providers that seek to prepare individuals for successful entry into an apprenticeship program.

The names of the cross-cutting competencies come from the U.S. Department of Labor's Competency Model Clearinghouse and definitions for each can be viewed at https://www.careeronestop.org/CompetencyModel/competency-models/building-blocks-model.aspx

The scoring system utilized to evaluate the level of competency required in each cross cutting skill aligns with the recommendations of the Lumina Foundation's Connecting Credentials Framework. The framework can be found at: http://connectingcredentials.org/wp-content/uploads/2015/05/ConnectingCredentials-4-29-30.pdf

DETAILED JOB FUNCTIONS

JOB FUNCTION 1: [Job function 1]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	

2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	

6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency F:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency G:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency H:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 2: [Job function 2]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	

6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency F:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency G:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency H:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 3: [Job function 3]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	

6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency F:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency G:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency H:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 4: [Job function 4]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
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8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
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8. [Criteria 8]	

JOB FUNCTION 5: [Job function 5]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
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5. [Criteria 5]	
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8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 6: [Job function 6]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
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5. [Criteria 5]	
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7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
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6. [Criteria 6]	
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8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 7: [Job function 7]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	

6. [Criteria 6]	
7. [Criteria 7]	
8. [Criteria 8]	

Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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8. [Criteria 8]	

JOB FUNCTION 8: [Job function 8]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
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Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
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8. [Criteria 8]	

JOB FUNCTION 9: [Job function 9]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
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Competency B:	Core or Optional
PERFORMANCE CRITERIA	
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Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
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7. [Criteria 7]	
8. [Criteria 8]	

JOB FUNCTION 10: [Job function 10]

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
• [knowledge]	• [skills]	• [tools & technologies]

Competency A:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
2. [Criteria 2]	
3. [Criteria 3]	
4. [Criteria 4]	
5. [Criteria 5]	
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Competency B:	Core or Optional
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency C:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency D:	**Core or Optional**
PERFORMANCE CRITERIA	
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Competency E:	**Core or Optional**
PERFORMANCE CRITERIA	
1. [Criteria 1]	
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Competency F:	Core or Optional
PERFORMANCE CRITERIA	
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Competency G:	Core or Optional
PERFORMANCE CRITERIA	
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Competency H:	Core or Optional
PERFORMANCE CRITERIA	
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STATEMENT OF INDEPENDENCE

The Urban Institute strives to meet the highest standards of integrity and quality in its research and analyses and in the evidence-based policy recommendations offered by its researchers and experts. We believe that operating consistent with the values of independence, rigor, and transparency is essential to maintaining those standards. As an organization, the Urban Institute does not take positions on issues, but it does empower and support its experts in sharing their own evidence-based views and policy recommendations that have been shaped by scholarship. Funders do not determine our research findings or the insights and recommendations of our experts. Urban scholars and experts are expected to be objective and follow the evidence wherever it may lead.

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www.urban.org

Multimodal Logistics

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How Can My Company Access and Use TransPORTs Funding?

TransPORTs has a limited pool of incentive funding for companies or organizations committed to developing a new or expanded registered apprenticeship program. Learn how our funding can help you customize a proven model of workforce development for your long-term occupational needs.

TransPORTs provides both technical and financial assistance to help your company or organization start a registered apprenticeship program.

We know that often relatively small costs can be a real barrier to companies interested in starting or expanding a registered apprenticeship program.

TransPORTs is committed to removing that barrier.

As a national industry intermediary for the U.S. Deparmtent of Labor, TransPORTs has a limited pool of incentive funds to help stimulate registered apprenticeship program development.

Incentive funds may be used toward:

- costs associated with registering your program with DOL or your state apprenticeship agency
- costs related to design and start-up of your apprenticeship program
- required classroom education or online training programs for required apprentice related technical instruction (RTI)
- other direct costs related to apprentice on-the-job training (excluding apprentice wages)
- equipment for apprentice on-the-job training
- training for apprentice mentors

There is no application process for incentive funds. Once you work with TransPORTs' Executive Director to create and sign an engagement package indicating that your company is comitting to start or expand a registered apprenticeship program, we can execute funding.

To learn how your organization can receive TransPORTs funding and technical assistance contact:

Barbara R. Murray
TransPORTs Executive Director, National Apprenticeship SME
(757) 401-8259
barbara.murray@transportsapprenticeship.com

BENEFITS FOR VETERANS
IN REGISTERED APPRENTICESHIP

Registered Apprenticeship
Earn. Learn. Succeed.

Did you know that Veterans have the opportunity to "earn and learn" in a Registered Apprenticeship, and may receive their GI Bill Educational Benefits?

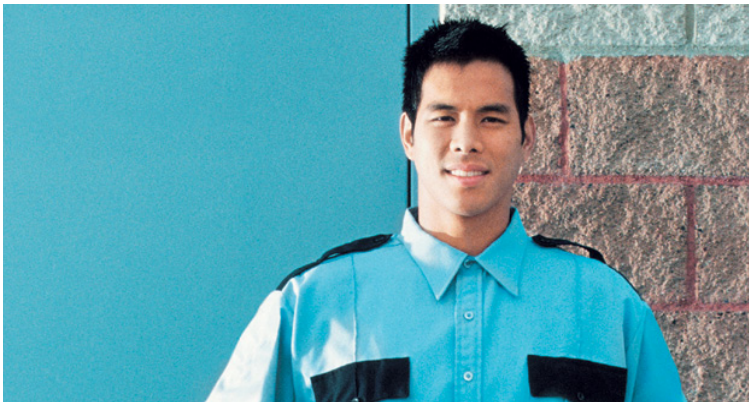
Snapshot: Apprenticeable Occupations

- Electrician
- Law Enforcement Agent
- Fire Medic
- Truck Driver
- Able Seaman

Eligible Veterans can use their GI Bill Educational Benefits for training and/or education.

Registered Apprenticeship allows Veterans to learn a trade through an apprenticeship, and use their GI Bill benefits to receive a tax-free monthly stipend.

The Post-9/11 GI Bill provides a stipend that is the equivalent of the Monthly Housing Allowance (MHA) of an E-5 with dependents (varies by employer location), and is paid in addition to the wages earned as an apprentice. Veterans continue to receive a stipend for every month of their apprenticeship. After six months of a Veteran's apprenticeship, the stipend is gradually reduced – and is offset by progressive wage increases. In addition, many Registered Apprenticeships have some classroom training, and apprentices can receive $83 per month for books and supplies.



What is a Registered Apprenticeship?

It's a national system of employer-driven on-the-job training delivered through partnerships with companies like yours. With a network of over 150,000 employers in more than 1,000 occupations, Registered Apprenticeship has trained millions of apprentices for over 75 years. Registered Apprenticeship is an "earn and learn" training model that combines work-based learning with related classroom instruction using the highest industry standards. When you establish a Registered Apprenticeship program, you develop a world-class workforce, enhance your company's bottom line, and retain your skilled workers.

Benefits for Veterans in a Registered Apprenticeship

- **A paycheck:** From day one, you will earn a paycheck guaranteed to increase over time as you learn new skills. As a veteran, your paycheck is supplemented by your GI Benefit.
- **Working for Top Companies:** Many of America's top companies have Registered Apprenticeships, such as Ford Motor Company, UPS, Siemens, GE, and Cummins, Inc.
- **A Career:** Once you complete your apprenticeship, you will be on your way to a successful long-term career with a competitive salary and little or no educational debt.
- **National Industry Certification:** When you complete a Registered Apprenticeship, you'll be certified and can take your certification anywhere in the U.S.

Benefits of Hiring Veterans for a Registered Apprenticeship

- **Work Ethic** – Through their training and military culture, veterans typically have the work ethic that any business owner would be thrilled to have on their team.
- **Opportunity for Direct Entry** – The military has over 70,000 active apprentices in over 125 occupations, including welders, mechanics, plumbers, machinists and more. Many of today's veterans have the skills and experience beyond the entry level apprentice. Contact Office of Apprenticeship or State Approving Agency staff to learn about how you can accelerate Veterans' transition to their new career.
- **Recruiting and Retaining Skilled Talent** – Military candidates have been trained to work for efficiency, and possess the self-discipline that many hiring managers seek. The combination of Registered Apprenticeship and the GI Benefits help keep your skilled Veteran workers.

Getting Your Employee their GI Benefits for Registered Apprenticeship

1 Step One

Employers wishing to participate in a Registered Apprenticeship should contact the U.S. Department of Labor's Office of Apprenticeship for details on how to build your workforce through apprenticeship at **http://www.doleta.gov/oa** or at (202) 693-2796

If your company is already a Registered Apprenticeship Sponsor, go to Step 2.

2 Step Two

Contact your State Approving Agency (SAA) to have your Registered Apprenticeship program approved to offer eligible veterans the opportunity to receive GI Bill education benefits. To find the SAA in your state: **http://www.nasaa-vetseducation.com/contacts/** or call 1-800-GIBILL1 (800-442-4551)

3 Step Three

Once your company is approved, your Veteran employees/apprentices may apply for their GI Bill benefits with the Department of Veterans Affairs (VA). Eligible Veterans can apply for benefits at: **http://www.gibill.va.gov/apply-for-benefits/** or call 1-800-GIBILL1 (800-442-4551)

TransPORTs

Transportation, Distribution & Logistics Registered Apprenticeships

Why Choose Registered Apprenticeship?

Registered apprenticeship is a centuries-old, proven model of workforce development. It offers employers and workers alike unique, immediate and long-term benefits. Employers benefit from increased workforce training ROI, increased worker productivity, lowered employee turnover, greater workforce diversity, and a structure process for knowledge transfer from retiring to younger workers.

Registered apprenticeship is a structured method to provide training in critical occupations through paid on-the-job learning and related technical instruction (RTI); it is a proven method of developing a skilled, productive, loyal workforce of next-generation company supervisors and leaders.

How Does It Work?

You – the employer – create a program that meets your workforce demands. You determine the hiring qualifications for apprentices and then accept as many new hires or incumbent workers that you want into the program. Apprentices are employees, however their starting wage is typically 50 percent of a master/Journeyworker pay rate for the same occupation. Apprentices get on-the-job training (OJT) under the supervision of a mentor or skilled supervisor of your choice to complete their required 2000 annual hours of OJT. In addition apprentices are required to complete approximately 144 contact hours of RTI -- you choose the classes, you choose the training provider. As the apprentice demonstrates competency in skill areas you determine are critical for the job they receive regular pay increases. The length of an apprenticeship program depends on the occupation – most are between 2-4 years in length but they can be as short as one year.

Who Can I Hire as an Apprentice?

Employers create the minimum hiring qualifications for their apprenticeship program. While each industry establishes its own minimum apprentice age requirement, the typical minimum age is 18. Most apprenticeship programs require applicants to have a high school diploma or GED and most prefer completion of specific, related courses. Some apprenticeship programs will award credit for prior training received through military service or prior work experience. Apprentices can be incumbent workers or new hires. You can determine what type of tests applicants must pass, credentials they must hold, experience they must have and/or other standards they must meet.

Why Register a Program?

Formally registering your apprenticeship program enables your employees to earn a nationally-recognized, portable industry credential and your company to access federal and state funding to offset program costs.

Contact Barbara R. Murray, TransPORTs Executive Director & SME to learn how your company can create a customized registered apprenticeship training program today: barbara.murray@transportsapprenticeship.com or (757) 401-8259.

WWW.TRANSPORTSAPPRENTICESHIP.COM

What is Related Technical Instruction?

One of the five core components of a registered apprenticeship program is related technical instruction (RTI). All apprentices in a registered program are required to complete approximately 144 contact hours of RTI for each year of their apprenticeship. RTI complements their on-the-job learning (OJL), ensuring that they have the technical and theoretical knowledge to become high-skilled workers.

Who provides the RTI?

You can choose from several options for your apprentices' RTI provider(s):

1. **You**! If you already provide in-house instruction related to apprentices' OJL that can count toward their RTI.
2. **An association or union.** If you are a member of an industry association, or your company is part of a union, which provides classroom training in areas directly related to your apprentices' occupational skill set that can be applied toward their RTI.
3. **A community or technical college.** Noncredit workforce training or for-credit academic courses relevant to your apprentices' occupational skill needs which are offered by community and technical colleges can count toward RTI.
4. **An equipment provider.** If a manufacturer provides classroom, online or hybrid instruction in equipment that your apprentices use as part of their occupation, that non-OJL instruction can count toward their RTI.

What does the RTI cover?

You decide what RTI will cover for your apprentices. TransPORTs can work with you to match courses offered through nearby community and technical colleges – or online through associations – with the work process outlines you create for the apprentices' occupation. Courses typically focus on technical instruction but may also include general education courses.

What does it look like?

144 hours of RTI annually is actually very manageable. **When you break it down, 144 hours equates to….**
…4 non-credit or for-credit classes at a community or technical college OR
…3.5 one-week classroom, online or hybrid instructional sessions OR
…18 one-day (8 hour) classroom, online or hybrid instructional sessions OR
…any combination that meets your workforce needs

When would my apprentices take their RTI?

You decide the schedule for your apprentices' RTI. Typically companies choose one of three formats:

- **Front-Loaded:** apprentices complete all of their RTI before starting their OJL
- **Segmented:** apprentices alternate between RTI and OJL
- **Simultaneous:** apprentices complete RTI during the day or at night or on weekends over the course of the apprenticeship while they work their full-time OJL

The ABC's

of Registered Apprenticeship

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Closing Keynote

Nicholas Wyman

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Prepared for:
Kentucky Registered Apprenticeship Summit
Kentucky Exposition Center
September 10-12, 2018

Chief Executive
Institute for Workplace Skills & Innovation

'Vocational Education is Smarter Than You Think'

Many of today's rewarding and well-paying jobs do not require a university degree, but do require some form of post-secondary training, as well as general workplace skills: the ability to communicate well, to collaborate, to problem-solve, and to adapt to change. One of the best ways to get these skills is through apprenticeship training.

A narrow focus on college preparation has become the norm in today's high schools. But where is it leading? Youth unemployment remains stubbornly high even as millions of good jobs go unfilled. The focus on college preparation often fails to make one important connection: the connection between school to the world of work.

Apprenticeship is a time-tested method of education and career training that combines academic study with hands-on application, leading to technical mastery. Apprenticeships are a core aspect of job training and education in countries like Switzerland and Germany, where youth unemployment rates are impressively low. In those countries, apprenticeships are the preferred method for training people in a vast array of careers, including everything from engineering to the culinary arts.

For the last several decades, apprenticeships were on the decline in the U.S, and tended to be limited to a narrow range of fields. But these days, they're making a resurgence. Apprenticeships are becoming more sophisticated, adapting to 21st century needs and reaching into a much greater number of fields, including IT, health care, hospitality, advanced manufacturing, and many others.

People, Programs and Partnerships – That work.

Introducing apprenticeships at the high school level can prepare young people to launch rewarding careers early. Collaborations between schools and local industry are a powerful way to connect students with these opportunities.

I recently caught up with Dr. John Gaal of the St. Louis Carpenter's District Council about a program that has been very successful in preparing students for careers in a specialized field of carpentry: floor-laying. Students in the Bayless Middle Apprenticeship Program (MAP) begin a pre-apprenticeship in their junior year of high school. They spend half the school day in a traditional classroom, and the other half learning their craft hands-on under the guidance of licensed professionals. After high school graduation they're eligible for placement into a Registered Apprenticeship, leading an associate's degree and journeyworker certification.

MAP students learn how to create, install, and restore hardwood, ceramic tile and other types of flooring for residential and commercial buildings. They are paid while they're learning and prepared for careers in well-paying fields.

MAP is a collaboration of the county's public school districts and the St. Louis Floor Layers Joint Apprenticeship Program. It's a good example of how skills-based education can re-engage students in their education and at the same time prepare them to enter in-demand fields. Ninety five percent of MAP participants successfully complete the program, graduating with a clear path towards a lucrative career.

John explains that it all has to do with relevance, or as he says, "Bringing the theoretical skills of the math class into the shop, and the practical skills of the shop into the math class".

Like any good apprenticeship program, MAP connects learning directly to in-demand jobs and post-secondary education. It allows young people to launch their careers early, earn while they learn, and avoid the burden of student loan debt. MAP students are also more engaged in school and become better students. Data gathered on the program shows that MAP students had significantly higher GPAs and better attendance rates than similar students who did not participate in the program.

Apprenticeships help students discover and apply their natural aptitudes. At the same time, they connect core academic curriculum with real-world application. Of his own apprenticeship 28 years ago, John recalls, "If we were talking about laying out a roof rafter, twenty minutes later we'd walk out in the shop and lay out that roof rafter. It wasn't just chalk on the board."

Vocational Education Isn't a Strait Jacket – It's a Set of Wings

For many, learning by doing is essential. Giving students the opportunity to engage in hands-on work is an important way to align education with working life.

Skill-based education gives young people the chance to get experience and gain confidence early. Many apprentices continue to develop their

skills and pursue further education down the road. Dr. Gaal is a perfect example—a carpentry apprentice who went on to obtain a bachelor's degree in architecture, followed by advanced degrees in business and organizational leadership. His early apprenticeship is where he "learned how to learn," he says.

In today's world of work, where the pace of technology demands the ability to rapidly and flexibly upgrade one's skills, the hands-on nature of apprenticeship has never been more relevant, or more necessary.

Prizes

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THE ASPEN INSTITUTE
ECONOMIC STRATEGY GROUP

Scaling Apprenticeship to Increase Human Capital

Robert I. Lerman*

July 1, 2018

Abstract: The 2016 election heightened an ongoing debate in the United States about how best to respond to two of the foremost economic challenges of the current era: stagnant wages and a dearth of promising career prospects for American workers without a bachelor's degree. These challenges persist despite a dramatic increase in recent decades in years of schooling and sizable investments (by both the U.S. government and individual students and their families) in traditional forms of higher education. In this paper, I argue that a large-scale apprenticeship program could address these challenges, while also yielding substantial additional gains for employers and the U.S. economy. I first review the evidence on apprenticeship, which suggests that increasing the availability of apprenticeships would increase youth employment and wages, improve workers' transitions from school to careers, upgrade those skills that employers most value, broaden access to rewarding careers, increase economic productivity, and contribute to positive returns for employers and workers. I then propose policies to stimulate a large-scale expansion of apprenticeship in the United States.

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1 The Challenge: Improving the Skills, Productivity, and Wages of Americans

The 2016 election heightened an ongoing debate in the United States about how best to respond to two of the foremost economic challenges of the current era: stagnant wages and a dearth of promising career prospects for American workers without a bachelor's degree. This paper argues that building a large-scale apprenticeship system in the United States would address both of those challenges, while also yielding substantial additional gains for employers and the U.S. economy.

Apprenticeship programs combine academic and structured, work-based learning under a mentor or supervisor. They allow students to earn wages and contribute to production, while working towards a valuable, occupational-based credential. Apprenticeship programs improve the learning process (as students directly apply what they learn), encourage student engagement, incentivize students to perform well in academic courses, increase the match between workers' skills and labor market demands, and widen access to rewarding careers for workers who prefer learning-by-doing over traditional classroom education and the four-year college model.

Wage stagnation, while no doubt worsened by the country's slow, unequal recovery from the Great Recession, is not a new trend. Men's long-term earnings have stagnated with each passing cohort from those entering the workforce in 1967, to those entering in 1983. (Women's earnings increased 59% over the period, but from a low base.) Research (Guvenen, 2018) suggests that this wage stagnation is driven largely by low starting wages, a pattern which suggests weak transitions from school to the labor market. Commentators and various political factions blame these labor market problems on everything from bad trade deals, to declines in manufacturing jobs, to the outsourcing of jobs, to an uncompetitive tax and regulatory environment, to lax immigration policy.[1] There's another contributing factor that often receives less attention: the weaknesses of the U.S. secondary, postsecondary, and job training systems in preparing many students for well-paid jobs and rewarding careers.

U.S. researchers too often equate "skills" with years of schooling, completion of degrees, or scores on tests of math and verbal capabilities. To Goldin and Katz (2008), increases in educational attainment have been too slow to yield healthy economic growth and reduce wage inequality. This view of skills is one driver of the dramatic expansion of higher education spending over the last decades. In 2013, the United States spent $27,900 per full-time equivalent student, 89% more than the OECD average of $14,800.

Despite increases in years of schooling, added government spending, and the buildup of mountains of student debt, U.S. employers report that they face a serious skills mismatch in various occupations, especially those in technical fields. One survey of a nationally representative sample of manufacturing companies found that "eighty-four percent of manufacturing executives agree there is a talent shortage in US

[1] In a review of factors affecting the 1999-2016 decline in labor force participation, Abraham and Kearney (2018) find that trade and the penetration of robots into the labor market, are the most important factors.

manufacturing, and they estimate that 6 out of 10 open skilled production positions are unfilled due to the shortage" (Giffi, Dollar, Gangula, & Rodriguez, 2015). This skills shortfall in manufacturing is primarily in jobs that require occupational and employability skills and is not necessarily about a shortfall in the general skills that come with many college degrees. In fact, worker productivity depends heavily on occupational competencies and employability skills such as communication, teamwork, the ability to efficiently allocate resources, problem-solving, reliability, and responsibility. Strikingly, in hard-to-fill jobs, firms generally prefer relevant work experience over a bachelor's degree (Fuller & Raman, 2017).

The myriad nature of skills raises questions about the near-exclusive focus by policymakers and researchers on schooling and academic test scores in the United States. So, too, does the recognition that many young people become disengaged from formal schooling, leading to weak high school outcomes (as reflected in high rates of enrollment in remedial coursework in two-year colleges) and low completion rates for community college students. Of students starting a two-year community college program in 2012, only 22% of all students and only 12% of black students had graduated within three years (NCES, 2018). Meanwhile, fewer youth have been gaining valuable work experience. The employment rate for 16- to 19-year-olds dropped from 42% in 1990 to 29% in 2017.

As I describe below, a good deal of evidence suggests that apprenticeship programs are more cost-effective than academic-only approaches at raising skill levels, especially for employability and occupational skills. Yet the United States has lagged far behind other developed countries—countries like Germany and Switzerland, but also Australia, Canada, and England—in creating apprenticeships. In these countries, apprentices constitute about 2.5-3.0% of the labor force, or about 10 times the U.S. rate.

Increasing the availability of apprenticeships would increase youth employment and wages, improve workers' transitions from school to careers, upgrade those skills that employers most value, broaden access to rewarding careers, increase economic productivity, and contribute to positive returns for employers and workers. This memo reviews the evidence on apprenticeship programs and presents policy proposals to upgrade human capital by stimulating a large-scale expansion of apprenticeships.

2 Advantages and Disadvantages of Expanding Access to Apprenticeship

2.1 The Advantages

Apprenticeships are distinctive in that they enhance both the worker (supply) side and the employer (demand) side of the labor market. On the supply side, the financial gains to apprenticeship are strikingly high. Studies on U.S. programs indicate that apprentices do not sacrifice earnings during their education and training, and that their long-term earnings benefits exceed the gains to completing a degree at a community college (Hollenbeck, 2008). Recent reports from the state of Washington indicate that the gains to earnings from apprenticeship programs far surpass the gains to all other

alternatives (Washington State Workforce Training and Education Coordinating Board, 2014). A broad study of apprenticeship in 10 U.S. states also documents large and statistically significant earnings gains from participation in apprenticeship programs (Reed et al., 2012).

These results are consistent with many studies of apprenticeship training in Europe showing high rates of return for workers. One study (Fersterer, Pischke, & Winter-Ebmer, 2008) exploited variation in apprentices' abilities to complete their programs (caused by firms going out of business) to estimate the effects of additional years of apprenticeship. The researchers found that apprenticeship training raised wages by about 4% per year of training. For workers completing a three- to four-year apprenticeship, post-apprenticeship wages were 12-16% than the wages of those who did not complete an apprenticeship because the firm went out of business. Because the workers' costs of participation were often minimal, the Austrian study found high overall benefits and modest costs.

Noneconomic outcomes are more difficult to quantify, but evidence from Europe suggests that vocational education and training in general is linked to higher confidence and self-esteem, improved health, higher citizen participation, and higher job satisfaction (Cedefop, 2011). These relationships hold even after controlling for income. An Australian study found that quality apprenticeships improve mental health (Buchanan, 2016).

On the demand side, employers can feel comfortable raising the skill requirements and the complexity of tasks that new hires are expected to accomplish, knowing that their apprenticeship programs will ensure an adequate supply of well-trained workers. Firms reap several additional advantages from their apprenticeship investments (Lerman, 2014). They save significant sums of money in the form of reduced recruitment and training costs, reduced errors in placing employees, and reduced costs when the demand for skilled workers cannot be quickly filled. Other benefits of apprenticeship for firms include reliable documentation of appropriate skills, increased worker productivity, higher morale, and a reduction in safety issues.

Another benefit to firms, rarely captured in studies, is the positive impact of apprenticeship on innovation. Well-trained workers are more likely to understand the complexities of a firm's production processes, and to identify and implement technological improvements, especially incremental innovations that improve existing products and processes. A study of German establishments documented this connection and found a clear relationship between the extent of in-company training and subsequent innovation (Bauernschuster, Falck, & Heblich, 2009).

The evidence suggests that employers achieve positive returns on their investments in apprenticeship. After reviewing several empirical studies, Muehlemann and Wolter (2014) conclude that:

> ...in a well-functioning apprenticeship training system, a large share of training firms can recoup their training investments by the end of the training period. As

> training firms often succeed in retaining the most suitable apprentices, offering apprenticeships is an attractive strategy to recruit their future skilled work force… (p. 1)

In the United States, evidence from surveys of more than 900 employers indicates that the overwhelming majority believe their apprenticeship programs are valuable and produce net gains (Lerman, Eyster, & Chambers, 2009). Nearly all sponsors reported that their apprenticeship program helps them meet their skill demands. Eighty-seven percent reported they would strongly recommend registered apprenticeships; an additional 11% recommended apprenticeship with some reservations. A recent U.S. study found 40-50% returns for two expensive apprenticeship programs (Helper, Noonan, Nicholson, & Langdon, 2016).

Apprenticeships are also a useful tool for enhancing youth development. They integrate what young people learn in the classroom with their on-the-job experiences, which benefits hands-on, nontraditional learners. Early apprenticeships can help engage youth and build their identities (Halpern, 2009). Youth who participate in apprenticeships early in their careers also benefit from a longer period of economic returns to training and a lower probability of developing bad work habits.

Young apprentices work with adult mentors (Halpern, 2009). These mentors and other supervisors not only teach young people occupational and employability skills but also offer encouragement and guidance, provide immediate feedback on performance, and impose discipline. Unlike community colleges or high schools, where one counselor must guide hundreds of students, each mentor deals with only a few apprentices.

Youth apprenticeships can be less costly for employers than programs focused on older workers. Wages can be low because youth have fewer medium- and high-wage alternatives, and because youth have fewer family responsibilities and are more able to sacrifice current for future income. For example, while Swiss firms invest heavily in their apprenticeship programs, they pay their young apprentices very low wages during the apprenticeship period.

Most government human capital programs offer government funding each year (per full-time equivalent trainee) and result in a social cost in the form of the foregone earnings of trainees. In apprenticeship programs, by contrast, there is an initial fixed cost for helping employers establish apprenticeships, but subsequent years require far less government funding as employers bear most of the long-term costs of training. (Firms recover a significant share of their costs during the apprenticeship itself.) Moreover, the foregone earnings of apprentices are modest since they receive wages during their training and as they contribute to production. These contributions allow firms to recover a significant share of their costs during the apprenticeship itself.

2.2 The Disadvantages

Adopting the policies recommended below for expanding apprenticeship may carry some disadvantages. One such disadvantage is that employers may not respond by

offering high-quality apprenticeships at scale. These initiatives will no doubt focus the energy of policymakers, energy that might otherwise have been devoted to improving existing educational programs. Thus, even if the performance-based funding for apprenticeships is not spent because few new apprenticeships are generated, other more effective initiatives may be foregone.

A second potential disadvantage is that some of the proposed funding might support employer apprenticeships that would have been created even in the absence of government funding. A third is that weak counseling might lead many young people into apprenticeships that are a bad fit. (Still, apprenticeships are likely to yield better matches between worker interests, worker skills, and the demands of firms than many existing training programs.)

Finally, some scholars are concerned that apprenticeship training, due to its specificity to one industry or occupation, may yield weaker capabilities to adapt to technological change. While this concern is not without merit, I would argue that apprenticeships are more likely than traditional educational models to provide many participants with confidence in their ability to learn (and thus, if necessary, later adapt), as well as with powerful incentives to perform well in their academic coursework.

Recently released data from the 2016 National Household Education Survey found that former apprentices were very likely to apply the skills they learned during their apprenticeship to their current job. Among workers ages 40 and over, 67% of those completing apprenticeships of one year or more reported using the skills they learned in the program all or most of the time; another 24% reported doing so some of the time.[3] European studies yield similar results (Clark & Fahr, 2001; Geel, Mure, & Backes-Gellner, 2001).

3 Current Barriers and New Proposals

3.1 Current Barriers to Apprenticeship in the United States

The experiences of Australia, Canada, and England demonstrate that scaling apprenticeship is quite possible, even outside countries with a strong tradition of apprenticeship. While none of these countries have the strong apprenticeship tradition seen in countries like Austria, Germany, or Switzerland, they have nonetheless grown significant programs. In fact, if apprenticeships as a share of the U.S. labor force reached the levels already achieved in Australia, Canada, and England (on average), the United States would attain over 4 million apprenticeships, about 9 times the current number of registered apprenticeships in the civilian sector.[4]

A government role in apprenticeship makes sense economically and socially. Like other public investments in career-focused education and training, apprenticeships lessen

[3] Tabulations by the author from the 2016 National Household Education Survey.
[4] Currently, the United States has 444,000 registered apprenticeships. There are an unknown number of independent apprenticeships not registered with state or local governments. See data sources by country in Appendix A.

credit constraints for students, generate productivity gains not fully captured by students or firms, and lower the excess burdens and administrative costs of transfers. As a cost-effective method for subsidizing preparation for careers, apprenticeships lower political pressures to increase government funding of higher education and implement other policies that impose economic distortions (such as increasing the minimum wage). From a social perspective, apprenticeships are likely to increase mobility and reduce inequality by improving career prospects for those who learn best by doing.

Why, then, has the United States failed to generate the kind of large-scale apprenticeship program seen in other developed countries? In this section, I describe the historic barriers to expansion in the United States.

A Failure to Try

One barrier is a failure to try. Overall, the federal government has devoted less than $30 million (per year) to the Office of Apprenticeship (OA) to supervise, market, regulate, and publicize the system.[5] Many states have only one employee working under their OA. Were the United States to spend what Britain spends annually on apprenticeship, adjusting for differences in the size and composition of the labor force, it would provide at least $9 billion per year for apprenticeship. In fact, the British government spends as much on advertising its apprenticeship programs as the entire U.S. budget for apprenticeship.

Total government funding for apprenticeship in the United States has been minimal, often less than $100 per apprentice annually (Reed et al., 2012). Meanwhile, the annual cost of instruction and support services per full-time equivalent student in two-year public colleges was approximately $16,000 in 2008-2009 (Cellini, 2012); today's annual costs are no doubt substantially higher. The Federal Pell Grant program for low- and lower-middle-income college students costs about $27 billion per year, with a good chuck of the spending going toward career-focused programs in community and career colleges (Rethinking Pell Grant Study Group, 2013).

The Structure of the Registered Apprenticeship System

The second barrier is the complex administrative structure of the registered apprenticeship system. This includes separate state administrations in half the states and federal governance in the other half; the requirement that each firm or set of firms have an approved set of occupational skill frameworks; the lack of national occupational frameworks; delays in the approval process; and the lack of an auditing system to assure quality.

[5] Recently, federal spending on apprenticeship demonstrations and state expansion grants has increased by about $50-90 million per year. Annual funding for the Office of Apprenticeship remains at about $30 million.

Limited Information

A third barrier is the limited capabilities of OA staff and intermediary organizations to sell and organize apprenticeships. Because few employers outside commercial and industrial construction offer apprenticeships, most employers are unlikely to hear about the model from other employers or from workers in other firms. Compounding this problem are two factors: the difficulty of finding information about the content of existing programs, and the fact that developing apprenticeships is complicated for most employers and often requires technical assistance that is unavailable in most of the country.

Asymmetric Funding Treatment

A fourth issue is the asymmetric treatment of government funding for postsecondary education and training. Pell grants, subsidized loans, and state college subsidies provide financial support to students taking for-credit courses. Yet, in general, similar subsidies for academic-related instruction linked to apprenticeships receive little government aid.

3.2 The Proposals

So how can the United States overcome these problems and scale apprenticeships? Building and sustaining a high-quality apprenticeship system will require several elements, including:

- effective branding and broad marketing;
- incentives for direct marketing and organizing apprenticeships to private and public employers;
- credible, recognized occupational standards with continuing research on changing requirements;
- public funding for off-job quality instruction;
- a system of credible end-point assessments of apprentices and programs;
- one or two certification bodies to audit programs and issue credentials;
- simple systems enabling employers to create and to track the progress of apprentices;
- counseling and screening for prospective apprentices to insure they have the aptitude for, and interest in, the field;
- training for the trainers/mentors of apprentices; and
- research, evaluation and dissemination.

Recognizing the United States cannot accomplish this vision overnight, I focus on four feasible initiatives. The goals are to achieve a major increase in the scale of the publicly-supported apprenticeship system within a few years, and to provide an infrastructure for long-term expansion.

Policy Proposal 1: Develop an Apprenticeship Brand

The federal and/or state governments should create a distinctive and quality brand. South Carolina chose to link apprenticeship with local pride by using "Apprenticeship Carolina" as its brand name. Britain has now established a copyright for the term "Apprenticeship" so that employers cannot claim to offer an apprenticeship without meeting the terms of the established program.

Once a brand name has been selected – "American Apprenticeships," let's say -- the program should advertise to the public, focusing first on firms and later on potential apprentices. Political officials, business leaders, and the media should highlight apprenticeship as a high-quality career option in all types of occupational areas. Videos of successful employers and apprentices should be widely featured. This proposal is likely to require minimal funding—the United Kingdom spends about $30 million a year on advertising apprenticeships.

Federal, state, and local governments could show leadership and credibility by creating apprenticeship positions in the public sector. A large share of state and local employees works in occupations that could be filled through apprenticeships, in positions in information technology, accounting, health care, administration of parks and courts, and security (including police and fire). Such a step would be feasible and cost-effective. Britain now requires government agencies to fill 2.3% of their jobs with apprentices.

Policy Proposal 2: Establish and Fund a Public/Private Entity to Develop and Maintain Apprenticeship Occupational Frameworks

These occupational frameworks should reflect both employer needs and long-term skill requirements. Consensus frameworks are especially important if the public sector provides funding for the general skills component of apprenticeships (i.e., for skills that have value outside the training firm). Employers rarely have the time to develop such frameworks, nor do all employers in the same industry always share a common vision. To ensure that American Apprenticeships remains a quality brand and to simplify the process of implementing apprenticeships, the Congress should establish the American Apprenticeship Standards Institute (AASI), which would be tasked with researching, creating, and updating apprenticeship competency frameworks for a broad range of occupations.

Working with industry associations and individual public and private employers, the AASI would produce frameworks with potential job titles, occupational pathways, certification and licensure requirements, salary ranges, and employment opportunities. The frameworks should be limited to about 500-600 occupations in order not to be so narrow as to limit the range of skills apprentices can apply, or so broad as to lack direct relevance to employer demands.

Each framework should describe the following:

- cross-cutting competencies, including personal effectiveness (such as reliability, initiative, interpersonal skills, and adaptability);
- academic competencies; and
- workplace competencies (such as planning, teamwork, scheduling, problem-solving, and working with tools).

The key occupational skill frameworks should begin with job functions (i.e., what functions should the skill worker in the occupation be able to complete at a high level?), and then specify both the competencies needed to undertake the job functions and the criteria for judging performance in those functions. The frameworks should also describe the knowledge, skills, and tools and technologies required to achieve the competencies and thus perform the job functions at a high level. Currently, examples of competency-based occupational frameworks already developed for the U.S. Department of Labor range from transmission line worker to community health worker.[6]

Employer programs could use these frameworks to gain official recognition for their apprenticeship programs. The United States could look to the United Kingdom's Institute for Apprenticeship as a resource for developing skill frameworks for many occupations. Funding of about $40 million per year should be sufficient to support the AASI's work in establishing competency-based frameworks and in ensuring they are up to date.

Policy Proposal 3: Establish Programs to Support the Direct Marketing and Organizing of Apprenticeships

Branding and broad marketing will not suffice without a well-developed system for selling and organizing apprenticeships. Directly marketing an apprenticeship program as a partial solution to the talent management efforts of individual employers is not easy and typically requires several face-to-face encounters. Employers whose interest is piqued by an advertisement must have a resource they can turn to for more information about developing and implementing an apprenticeship program. Working with a company to organize apprenticeships requires determining the most suitable occupations, developing a plan to combine work-based and academic instruction, and filling out the forms and other materials required for registering apprenticeships.

The United States should establish incentives for intermediaries (private or public) to market directly to, and organize apprenticeships for, employers. Current employees with state and federal labor departments have been unable to sell and organize effectively. In addition, the incentives should be structured so that intermediaries ensure apprentices receive the appropriate training and work-based learning experiences and achieve high completion rates. Funding should go only to those intermediaries that stimulate apprenticeships that follow the official occupational frameworks. Intermediaries should

[6] See Urban Institute (n.d.) for examples.

also help employers find and fund quality training options for the off-job components of apprenticeship.

Britain managed to achieve an apprenticeship scale of over 850,000 in about eight years, largely through the efforts of 850 employment and learning providers[7]. Australia achieves high levels of apprenticeship partly through private, often nonprofit, Group Training Organizations (GTOS). The GTOs, which serve as the formal employers and place apprentices with host employers, are tasked with: selecting and recruiting apprentices; paying wages and providing for workers' compensation, sick/holiday pay, and other employment benefits; managing the quality and continuity of training, both on and off the job; and providing the ongoing support necessary for the apprentice to complete the apprenticeship successfully.

The incentives should be sufficient to stimulate intermediaries to create 1.5-2 million additional apprenticeships over the next four years. Evidence from organizations suggests that the effective marketing and organizing of apprenticeships could be achieved at a cost of about $2,000 for each apprentice that completes the first 60 days of a program, along with an additional $2,000 for each apprentice that completes the program in full. The payments could vary with the long-term returns to occupations. One reason for expecting modest per-apprentice costs is that once employers establish an apprenticeship program, most are likely to continue the program over time (with less effort by intermediaries). The experience of U.K. intermediaries suggests that about 60-70% of apprentices hired are the result of repeat business from employers.

Along with intermediary incentives, the federal government should establish an independent auditing system to assure program quality and to avoid fraud. The audits, which would increase the credibility of the apprenticeship system, should identify the strengths and weaknesses of existing programs. Current funding levels are far too low for the Office of Apprenticeship to conduct appropriate audits. Since only the programs would be audited, not each apprentice, a sum of about $100 million should be sufficient to allow the OA to complete audits every two to three years. Following the experience of Ofsted in the United Kingdom, the audits could rank programs for quality and identify intermediaries with programs that are deemed inadequate to receive continued funding.

Unlike most government-supported human capital programs, a significant share of the long-term costs of apprenticeship programs will be borne by the employer in the form of apprentice wages and the costs of work-based training. The foregone earnings of apprentices will also be modest since they will receive wages during their training. Firms, meanwhile, will recover a significant share of their costs during the apprenticeship itself. The costs to the government will come largely in the form of setup costs and contributions to off-job training.

The gross costs of the incentive scheme will depend on the number of new apprentices that complete 60 days of their programs and the number that complete their programs in full. The annual costs will also depend on the rate of phase-in for the program. It will

[7] See https://www.aelp.org.uk/

take time to reach 1 million new apprenticeships and 750,000 completers per year. Assuming intermediaries stimulate half a million new apprenticeships per year, the initial costs of the incentives would total about $1 billion. In equilibrium, if the intermediaries successfully generated 900,000 new participants and 675,000 completers per year, the costs of the incentives would reach about $3.15 billion per year.

At scale, the stock of apprentices in any given year would reach well over 2 million. Since about three-fourths or more of the occupational and employability training for these apprentices would take place at worksites (at no public cost), full public support for the off-job training could be about $8 billion, raising the overall costs to $11.15 billion. For comparison, were these apprentices to attend community college full-time, the costs for instruction and services would amount to at least $32 billion per year (assuming the 2008 figure of $16,000/student reported by Cellini (2012)). Over time, the costs of incentives to intermediaries could fall as employers adopted apprenticeships without intermediaries and intermediaries lowered their costs by gaining repeat business.

Policy Proposal 4: Use Existing Funding for Off-Job Training and Incentives

One can make a strong theoretical and practical case for a system in which employers are not required to fund the off-job learning components of apprenticeship. Theoretically, the skills learned in the off-job courses are general in the Becker sense that the added productivity of the worker can be applied not only to his or her current employer, but to many other employers. For this reason, the employer may not be able to recoup the provision of this general training. The worker gains the benefit, and the government shares in the gains in the form of higher taxes and reduced transfers.

Federal, state, and local governments already spend tens of billions of dollars on an array of education and training programs. The effectiveness of government dollars would be far higher if at least some of these funds were made available for off-job apprenticeship training. Encouraging this shift in priorities, however, will require detailed analysis of each funding source.

In some cases, government funds could be substituted directly for employer funding, while in other cases existing government training funds could be made accessible for apprenticeship. Currently, for example, the Trade Adjustment Assistance (TAA) program provides funding to those who lose their jobs due to trade impacts. Participants receive both support for training, often in a community college program, and income support while undergoing training in the form of extended unemployment insurance. The regulations governing TAA could be changed to specifically allow funding to be used for the instructional component of a registered apprenticeship program, as well as the apprentice incentive program.

The U.S. Department of Labor's Workforce Innovation and Opportunity Act (WIOA) programs are already required to work with apprenticeship programs, but WIOA staff are ill-equipped to help scale apprenticeship. Some of WIOA's over $3 billion dollars could be directed toward the intermediary incentive program. Training WIOA business

services staff to sell and organize apprenticeships could also defray some of the costs of the incentive program.

Some of the $1.8 billion now allocated to Job Corps and YouthBuild could be redirected to apprenticeship initiatives, or made available to local program operators to market and organize apprenticeships. These two programs are expensive, cover only about 56,000 participants per year, and yield modest or no gains in earnings.[8] Although apprenticeships have demonstrated far higher earnings gains than existing programs, including Job Corps and YouthBuild, any diversion of funds should be accompanied by a renewed effort to target disadvantaged youth for participation in apprenticeships.

Funding for the Carl D. Perkins Career and Technical Education Act of 2006 has supported career and technical education in high schools and colleges. Some of the $1.7 billion annual outlays on the program could subsidize the cost of off-job training for apprentices.

Currently, the Pell Grant program spends about $27 billion per year. Over half of Pell recipients are in public two-year or for-profit colleges, often in career-focused education programs. Loan programs that are very costly to the federal government also support students in these programs. Allowing students to use Pell grants for apprenticeship would save significant sums and generate higher earnings gains. Although Pell grants are currently not well-suited for apprenticeship, Pell eligibility criteria could be modified to allow apprentices to use prorated Pell grants for the off-job component of their training. Also, one could raise the income protection allowance for students with apprenticeship earnings or treat any individual participating in a full-time apprenticeship as an independent student.[9]

State governments could encourage more apprenticeships with the use of their existing subsidies to community colleges. States commonly reimburse community colleges for some percentage of the cost of a full-time equivalent (FTE) student. Suppose the reimbursement rate were 60% of the costs of a FTE but that much of the actual and accredited learning (say, 70%) for an occupation program took place at the work site in an apprenticeship. If the costs of the community college instruction fell to only 40% of the normal costs of a FTE, but the state continued the 60% subsidy, then colleges could provide the classroom component of apprenticeship at no cost to employers. They could use the remaining 20% to sell employers on, and help them organize, apprenticeships.

The GI Bill already provides housing benefits and wage subsidies for veterans in apprenticeships, however funding levels for college and university expenses are far higher than for apprenticeship. Offering up to half of the GI Bill's per-recipient college benefit to reimburse employers for the off-job education and training when hiring a

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[8] Federal spending on Job Corps ($1.7 billion) is about 20 times the amount spent on YouthBuild (about $80 million). Also, YouthBuild attracts some private funding. Though these programs yield some benefits, the high costs generally do not justify the benefits. See Schochet, Burghardt, and McConnell (2006) and Miller, Mellenky, Schwartz, Goble, and Stein (2016). As of 2017, the cost per participant in Job Corps was about $34,000 per participant (Employment and Training Administration, 2016).

[9] I am grateful to Diane Jones for making these suggestions.

veteran into an apprenticeship program could be accomplished by amending the law. However, unless the liberalized uses of Pell grants and GI Bill benefits are linked with the intermediary incentive campaign to sell and organize apprenticeships, the take-up by employers is likely to be limited.

Another way of financing the off-job education of apprentices is to link the intermediary incentive program with youth apprenticeships in high schools. Since high school CTE courses, and some college courses within high schools, are already an entitlement, the funds to complement work-based learning in apprenticeships would be readily available.

Policymakers should consider starting such a policy at career academies—schools within high schools that have an industry or occupational focus—and regional career and technical education (CTE) centers. Over 7,000 career academies operate in the United States in fields ranging from health and finance, to travel, to construction. Career academies and CTE schools already include classroom-related instruction and sometimes work with employers to develop internships. Because a serious apprenticeship involves learning skills at the workplace, at the employer's expense, these school-based apprenticeship programs could reduce the costs of teachers, relative to a full-time student. If, for example, a student spent 2.5 days per week (or 50% of their time) in a paid apprenticeship, the school should be able to save 15-30% of the costs of educating a traditional, full-time student. Applying these funds to selling and organizing apprenticeships should allow the career academy or CTE program to stimulate employers to provide apprenticeship slots.

4 Conclusion

Today, funding for the "academic only" approach to skill development in the United States dwarfs the very limited amounts available to market and support apprenticeship. Yet apprenticeship programs yield far higher and more immediate gains in earnings than do community or career college programs and cost students and the government far less. Postsecondary education carries costs for students in the form of both tuition and foregone earnings, and sometimes fails to provide students with a useful degree or credential. In contrast, apprentices rarely lose earnings or are forced to take out student loans. Apprentices, through their connection with the employer, also work on up-to-date equipment and learn modern business practices.

Expanding access to apprenticeship programs could improve the lives of millions of Americans and help prevent further erosion of the middle class. Apprenticeships widen the pathways to rewarding careers by upgrading occupational skills, employability skills, and traditional academic skills. For hands-on and nontraditional learners, academic coursework completed in the context of an apprenticeship program can increase worker motivation and improve the efficacy of the delivery process. Furthermore, given the effects of these programs on worker productivity and innovation, firms will have an increased incentive to adopt "high road" strategies with respect to their apprenticeship programs. Especially in today's tight labor market, apprenticeships represent one of the best ways firms can attract and retain skilled workers.

While structural barriers to apprenticeship exist in the United States, federal investments in marketing and standards development, along with ongoing financial support for the off-job costs of apprenticeship, could overcome these barriers. And as more employers adopt apprenticeship strategies successfully, network effects could well take over, with employers learning from each other about the value of apprenticeship.

The United States undoubtedly has a long way to go before it reaches the apprenticeship levels in Australia, Canada, and the United Kingdom, let alone the level in Switzerland, where 95% of 25-year-olds have an occupational credential (70% through apprenticeship) and 25% hold bachelor's degrees. The example of the United Kingdom, however, proves that rapidly expanding apprenticeship as a quality brand for success in a wide range of occupations is feasible.

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Appendix A: Data on Apprenticeship and Labor Force Levels: Australia, Canada, England, and the United States

Table A1: Apprenticeships as Shares of Labor Force: Australia, Canada, England and United States

	Apprenticeships	Labor Force	Apprenticeship Share of LF
Australia	270000	13,180,000	0.020
Canada	453000	19,200,000	0.024
England, 2016-2017	917000	30,000,000	0.031
Average: Australia, Canada, and England	546,667	20,793,333	0.025
US, civilian	444,306	161,000,000	0.003
US Projected Civilian Apprentices	4,006,002		

Sources: See below for links to data on apprenticeship and labor force statistics

Australia
https://www.ncver.edu.au/data/data/all-data/apprentices-and-trainees-2017-september-quarter-data-slicer
http://www.abs.gov.au/ausstats/abs%40.nsf/mf/6202.0
Canada
http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/educ66a-eng.htm
http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/labor07a-eng.htm
http://www5.statcan.gc.ca/cansim/a47
England
http://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/headlinelabourforcesurveyindicatorsforallregionshi00
US
https://www.bls.gov/news.release/empsit.t01.htm
https://www.doleta.gov/oa/data_statistics.cfm

Chapter 10
Restoring Opportunity by Expanding Apprenticeship

Robert I. Lerman

Abstract Restoring opportunity requires jobs that can generate middle class incomes. Notwithstanding concerns about the declining share of middle-wage jobs, this chapter argues that building a robust apprenticeship system in the U.S. can sharply increase earnings and the share of American workers entering rewarding careers. By emphasizing "learning by doing" as a paid employee, apprenticeships are especially effective in preparing workers to gain a valued occupational qualification. They enhance youth development by providing a more engaging experience than schooling does and by linking young people to mentors. They encourage employers to upgrade jobs and develop job ladders. Apprenticeships currently represent a much smaller share of the workforce in the U.S. than in most other advanced countries. This chapter contends that expanding apprenticeship is feasible and a highly cost-effective strategy for restoring opportunity.

Keywords Apprenticeship • Labor market • High-skill jobs • Middle-skill jobs • Low-skill jobs • Job training • Unemployment • Wages • Occupations • Community colleges • Career academies • Career and technical education (CTE) • Licensing • Certification

Introduction

Central to concerns about opportunity in America is the erosion of middle class jobs. Economist David Autor (2010) highlights the polarization in the U.S. labor market, with computerization eliminating middle-skill jobs while shifting low-skill workers into poorly paid and difficult-to-automate service professions.

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I. Kirsch, H. Braun (eds.), *The Dynamics of Opportunity in America*,
DOI 10.1007/978-3-319-25991-8_10

A *Financial Times* report[1] on the United Kingdom found that, "Jobs are being created at the top and bottom of the skills scale, while those in the middle tier—including office administrators and blue-collar process operators—are losing out. The trend is intensifying the 'hour glass economy,' where new technologies increase low-skilled jobs but eliminate many in the middle that require intermediate skills." High youth unemployment rates in the U.S. and especially in Europe exacerbate these trends by keeping many workers from gaining initial work experience. According to *The Economist*, rapid technological change is lowering the costs of replacing workers with robots and wages are stagnating even as economic growth has resumed.[2]

Opportunity is becoming increasingly difficult to sustain in the context of widening educational divides that increase the supply of workers without a college education who need jobs. Although rates of high school graduation have increased in general, including for less advantaged groups, the majority of all workers and the vast majority of young minority male workers leave school without any qualification beyond high school. Low proficiency in literacy and numeracy is the norm for high school graduates (with no college), according to data from the Organisation for Economic Co-operation and Development's (OECD) Programme for the Assessment of Adult Competencies (PIAAC) (Holzer and Lerman 2015). The vast majority of high school graduates attend college, but as of 2014, only about 46 % of 25- to 34-year-old Americans had achieved an associate's (A.A.) or bachelor's (B.A.) degree. Young men, especially minority men, are particularly at risk, with only a modest share graduating either a two- or four-year college. Among 25- to 34-year-olds, 29 % of African-American and 19 % of Hispanic men had attained an A.A. or B.A. degree as of March 2014.[3]

The lack of work experience among youth is another major concern. Only one in three Black 18- to 22-year-old men held a job in March 2014; more than half had no work experience at all in 2013. Because work experience contributes substantially to career success, the high rates of joblessness of young people can weaken their long-term opportunities.

Are these trends inevitable and impervious to policy? Or can wise skill development approaches help engage young people and expand their job opportunities, partly by preserving middle class jobs? This chapter considers the potential of robust apprenticeship systems for increasing opportunity by raising skills, productivity, and wages, thereby increasing the chances for young people to find and hold jobs providing middle class incomes.

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[1] Weitzman, Hal, and Robin Harding. "Skills Gap Hobbles US Employers," *Financial Times,* December 13, 2011.

[2] "The Economics of Low Wages: When What Goes Down Doesn't Go Up." *Economist*, May 2, 2015.

[3] These figures come from the author's tabulations of the March 2014 Current Population Survey (CPS). The estimates may overstate the share of Black men with high levels of education as the data exclude men in jail or prison. In addition, the CPS is likely to undercount Black men just as the decennial census does, and these men probably have lower levels of education than men counted in the CPS.

The chapter begins by defining apprenticeship and describing why apprenticeship should be a central component of the nation's approach to preparing people for careers. Next, we consider whether apprenticeships, or any training, can restore opportunity in the context of a hollowing out of the middle of the distribution of jobs. Specifically, we describe skill requirements and alternative approaches to preparing and upgrading the skills of individuals for these occupations. Programs of academic education and apprenticeship programs emphasizing work-based learning have often competed for the same space, but the full picture reveals they can complement each other significantly. Then, we show how apprenticeship can affect the demand side of the market, encouraging firms to transform jobs into high-skill career positions. We consider the evidence on the costs and effectiveness of apprenticeship training in several countries. Of particular interest is the evidence on the impacts of apprenticeship on firms and new findings on whether apprenticeship training locks workers into specific occupations and limits their occupational mobility. The analysis examines the costs and benefits of apprenticeship versus school-based alternatives aimed at preparing young people for careers. We go on to discuss recent policy developments in the United States and the implications for the feasibility of expanding apprenticeship. The concluding section answers the question on the role of apprenticeship systems in rebuilding middle class jobs.

Defining Apprenticeship and Explaining Its Advantages

Apprenticeship training is a highly developed system for raising the skills and productivity of workers in a wide range of occupations, with demonstrated success abroad and scattered examples of success domestically. Apprentices are employees who have formal agreements with employers to carry out a recognized program of work-based and classroom learning as well as a wage schedule that includes increases over the apprenticeship period. Apprenticeship prepares workers to master occupational skills and achieve career success. Under apprenticeship programs, individuals undertake productive work for their employer; earn a salary; receive training primarily through supervised, work-based learning; and take academic instruction that is related to the apprenticeship occupation. The programs generally last from 2 to 4 years. Apprenticeship helps workers to master not only relevant occupational skills but also other work-related skills, including communication, problem solving, allocating resources, and dealing with supervisors and a diverse set of co-workers. The course work is generally equivalent to at least 1 year of community college.

In Austria, Germany, and Switzerland, extensive apprenticeships offer a way of upgrading the quality of jobs, especially in manufacturing, commercial, and managerial positions.[4] In these countries, apprenticeships begin mostly in the late high

[4] For a list of occupations using apprenticeships in several countries, see the occupational standards section of the American Institute for Innovative Apprenticeship website at www.innovativeapprenticeship.org

school years, absorbing 50–70 % of young people on their way to valued occupational qualifications (Hoffman 2011). OECD reports (2009, 2010) highlight the role of a robust apprenticeship system in limiting youth unemployment.

Apprenticeships within the U.S. and elsewhere show how construction occupations can reach high wages and high productivity. The question is whether the model can be extended and attract firms to upgrade other occupations. Apprenticeship expansion holds the possibility of substantially improving skills and careers of a broad segment of the U.S. workforce. Completing apprenticeship training yields a recognized and valued credential attesting to mastery of skill required in the relevant occupation.

Apprenticeships are a useful tool for enhancing youth development. Unlike the normal part-time jobs of high school and college students, apprenticeships integrate what young people learn on the job and in the classroom. Young people work with natural adult mentors who offer guidance but allow youth to make their own mistakes (Halpern 2009). Youth see themselves judged by the established standards of a discipline, including deadlines and the genuine constraints and unexpected difficulties that arise in the profession. Mentors and other supervisors not only teach young people occupational and employability skills but also offer encouragement and guidance, provide immediate feedback on performance, and impose discipline. In most apprenticeships, poor grades in related academic courses can force the apprentice to withdraw from the program. Unlike community colleges or high schools, where one counselor must guide hundreds of students, each mentor deals with only a few apprentices.

Apprenticeships are distinctive in enhancing both the worker supply side and the employer demand side of the labor market. On the supply side, the financial gains to apprenticeships are strikingly high. U.S. studies indicate that apprentices do not have to sacrifice earnings during their education and training and that their long-term earnings benefits exceed the gains they would have accumulated after graduating from community college (Hollenbeck 2008). The latest reports from the state of Washington show that the gains in earnings from various education and training programs far surpassed the gains to all other alternatives (Washington State Workforce Training and Education Coordinating Board 2014). A broad study of apprenticeship in 10 U.S. states also documents large and statistically significant earnings gains from participating in apprenticeship (Reed et al. 2012).

These results are consistent with many studies of apprenticeship training in Europe, showing high rates of return to workers. One recent study managed to overcome the obstacle that such studies tend to face where unmeasured attributes explain both who is selected for an apprenticeship and how well apprentices do in the labor market (Fersterer et al. 2008); the authors did so by examining how an event unrelated to the apprenticeship (the firm staying in or going out of business) caused some apprentices to have full apprenticeships while others found their apprenticeships cut short. The estimates indicated that apprenticeship training raises wages by about 4 % per year of apprenticeship training. For a three- to four-year apprenticeship,

post-apprenticeship wages ended up 12–16 % higher than they otherwise would be. Because the worker's costs of participating in an apprenticeship are often minimal, the Austrian study indicated high overall benefits relative to modest costs.

On the demand side, employers can feel comfortable upgrading their jobs, knowing that their apprenticeship programs will ensure an adequate supply of well-trained workers. Firms reap several advantages from their apprenticeship investments. They save significant sums in recruitment and training costs, reduced errors in placing employees, avoiding excessive costs when the demand for skilled workers cannot be quickly filled, and knowing that all employees are well versed with company procedures. Because employers achieve positive returns to their investments in apprenticeship, the worker and the government can save significantly relative to conventional education and training. After reviewing several empirical studies, Muehlmann and Wolter (2014) conclude that "…in a well-functioning apprenticeship training system, a large share of training firms can recoup their training investments by the end of the training period. As training firms often succeed in retaining the most suitable apprentices, offering apprenticeships is an attractive strategy to recruit their future skilled work force…"

One benefit to firms rarely captured in studies is the positive impact of apprenticeships on innovation. Well-trained workers are more likely to understand the complexities of a firm's production processes and therefore identify and implement technological improvements, especially incremental innovations to improve existing products and processes. A study of German establishments documented this connection and found a clear relationship between the extent of in-company training and subsequent innovation (Bauernschuster et al. 2009). Noneconomic outcomes are difficult to quantify, but evidence from Europe suggests that vocational education and training in general is linked to higher confidence and self-esteem, improved health, higher citizen participation, and higher job satisfaction (Cedefop 2011). These relationships hold even after controlling for income.

In the United States, evidence from surveys of more than 900 employers indicates that the overwhelming majority believe their programs are valuable and involve net gains (Lerman et al. 2009). Nearly all sponsors reported that the apprenticeship program helps them meet their skill demands—87 % reported they would strongly recommend registered apprenticeships; an additional 11 % recommended apprenticeships with some reservations. Other benefits of apprenticeships include reliably documenting appropriate skills, raising worker productivity, increasing worker morale, and reducing safety problems.

While apprenticeships offer a productivity-enhancing approach to reducing inequality and expanding opportunity, the numbers in the U.S. have declined in recent years to about one-tenth the levels in Australia, Canada, and Great Britain. Some believe the problems are inadequate information about and familiarity with apprenticeship, an inadequate infrastructure, and expectations that sufficient skills will emerge from community college programs. Others see the main problem as an unwillingness of U.S. companies to invest no matter how favorable government subsidy and marketing policies are. In considering these explanations, we should remember that even in countries with robust apprenticeship systems, only a minority

of firms actually hires apprentices. Because applicants already far exceed the number of apprenticeship slots, the main problem today is to increase the number of apprenticeship openings that employers offer. Counseling young people about potential apprenticeships is a sensible complementary strategy to working with the companies, but encouraging interest in apprenticeship could be counterproductive without a major increase in apprenticeship slots.

The high levels of apprenticeship activity in Australia, Great Britain, and Canada demonstrate that even companies in labor markets with few restrictions on hiring, firing, and wages are willing to invest in apprenticeship training. While no rigorous evidence is available about the apprenticeship's costs and benefits to U.S. employers, research in other countries indicates that employers gain financially from their apprenticeship investments (Lerman 2014).

Although apprenticeship training can prepare workers for a wide range of occupations, including medicine and engineering, apprenticeships are perhaps most appropriate for skilled positions that do not require a B.A. degree. A key question is whether these are the very jobs the country is losing and, if so, whether sufficient jobs amenable to apprenticeship will remain.

Patterns and Trends of Middle-Level Occupations

What are the mid-level or skilled sub-B.A. occupations that are most amenable to apprenticeship and significantly affected by the "hollowing out" of the middle class? Classifying mid-level occupations by a single distribution (say, by educational attainment or a score on a cognitive test) fails to capture the wide variety of skills required to master and be productive at specific jobs or occupations. One approach is to use wage as a proxy for skill in the particular job or occupation. Wages may be viewed as incorporating the skill levels along various dimensions together with the market valuation of those skills. However, wages reflect not only skill but also the riskiness, job satisfaction, responsibility, status, and flexibility of jobs and occupations. A second issue is that skill requirements and expertise required in an occupation might not change, but the wage return to the occupation might. Third, wages sometimes are a reward for tenure on the job; seniority often matters. Fourth, wage differences can come about from differences in bargaining power of workers in various fields. For example, the pay of longshoremen can depend on the ability of their representatives to gain strong returns because of the high costs of strikes relative to wage increases. Fifth, wages for the same occupation often differ widely across geographic areas, partly because of area differentials in the price of housing. Sixth, classifying occupations by mean wages can miss the wage variability within occupations.

A major proponent of the hollowing-out thesis ranks detailed occupations by their average wages in a base period (Autor 2010). Middle-skill jobs are in occupations in the middle segment of the average wage distribution in that period. Using his approach, Autor finds that middle-skill occupations are declining rapidly relative

to high- and low-skill positions. One of the main reasons is the increased power of computers to automate routine tasks that many middle-skill positions have long undertaken. Similar trends are apparently occurring in other countries. A paper by Goos et al. (2009) finds that middle-wage occupations declined as a share of employment in 16 countries.

The Autor approach provides a useful perspective but is subject to several limitations. One is the failure to capture the often wide distribution of wages within detailed occupations. Many sub-B.A. occupations can generate high wages at the top levels of quality and productivity. For example, the differences in wage levels, skill, and status are substantial between the occupations "cook at a restaurant" and "chefs and head cooks." Cooks are low paid, but chefs command a median wage that is about 25 % higher than the overall national median. Despite their limited formal education (only 13 % have a B.A. or higher), the top 25 % of chefs earn as much as or more than the median wage of four out of 10 college occupations (50 % or more with B.A. degrees). Were cooks and lower-level chefs upgraded to a status of high quality and productivity, earnings for a noncollege occupation could compete with earnings of many college occupations.

Occupations with above-average earnings and with a majority of workers without a B.A. cover a wide range of fields. Among them are construction managers, buyers and purchasing agents, lodging managers, appraisers, court reporters, various types of technicians, aircraft mechanics, police officers, police supervisors, and operators of gas plants.

In another approach to examining occupational trends, Holzer and Lerman (2009) use U.S. Bureau of Labor Statistics (BLS) estimates of education and training requirements to classify broad occupational categories. High-skill occupations are those in the professional/technical and managerial categories, while low-skill occupations are those in the service and agricultural categories. Middle-skill occupations are all the others, including clerical, sales, construction, installation/repair, production, and transportation/material moving. With this classification, middle-skill jobs show a decline but still make up roughly half of all employment today. In a 2013 article, Autor and Dorn predict middle-skill jobs will survive when they embody such human skills as interpersonal interaction, adaptability, and problem solving. Among other jobs, they cite medical paraprofessionals; plumbers; builders; electricians; heating, ventilation, and air-conditioning installers; automotive technicians; customer-service representatives; and even clerical workers who are required to do more than type and file.

A key question raised by Autor and others is how to characterize jobs that require "… situational adaptability, visual and language recognition, and in-person interaction." On one hand, preparing meals and driving a truck through city traffic are difficult to automate. Because these jobs need only modest training and attributes common across the population (dexterity, good eyesight, and language recognition), Autor sees them as commanding only low wages. But even these jobs could in principle involve pathways to reach "artisan" status.

Several occupations requiring a middle level of skills and good wages have increased a good deal since 1986, including medical therapists (such as respiratory,

recreational, and radiation therapists) by 30 %, carpenters (20 %), heavy vehicle maintenance specialists (25 %), and heating and air conditioning positions (21 %).

Taking Education, Training, and Labor Market Interactions into Account

The idea that education and training institutions should prepare people for current and future jobs raises several questions: Do jobs simply materialize from a single technology or family of technologies that effective employers eventually implement? Or, do employers confront a range of technologies, all of which can allow the company or public employer to remain competitive? Moreover, how does the choice of technology interact with the system of preparing or retraining workers?

An older literature (Piore and Doeringer 1971), now rarely cited, looked closely at segmented labor markets, where some employers choose to train, hire from within, and keep workers for long periods, while others operate mostly on the spot market, hiring and firing frequently and providing little training. Subsequently, many authors have highlighted that businesses have the choice to become "high road" vs. "low road" employers. For example, Osterman and Shulman (2011) insist that "firms have choices about how to organize work." They find examples of firms producing the same good or service using technologies that generate more or fewer skilled jobs paying good wages. In a landmark article providing a theoretical rationale for employer occupational training, Acemoglu and Pischke (1999) demonstrated how firms might optimize their hiring and training strategies in several ways, depending on the structure of the labor market and the potential permanence of the jobs.

Actual jobs and compensation vary widely within occupations, suggesting that the nature of work may depend on institutional settings that can lead different firms to choose different technologies to produce the same good or service. Given that production may be undertaken using a variety of skill distributions, the key policy questions become: 1) what are the skills within occupations that raise long-term wages and productivity, and, 2) what are the best approaches to educating and training workers to reach high levels of productivity and wages?

Skill Requirements for Workers to Reach Middle Class

The skills required for middle-level occupations are far from obvious. One issue is the appropriate level of generic academic skills. Another is the appropriate level of specificity in occupational skills. A third is the role of generic, nonacademic skills, such as communication, motivation, and responsibility. Some of all three types of skills are required for nearly all jobs, but the levels vary across occupations.

In the case of general academic requirements, U.S. education reformers have boldly claimed that "… *all* students — those attending a four-year college, those planning to earn a two-year degree or get some postsecondary training, and those seeking to enter the job market right away—need to have comparable preparation in high school" (Achieve 2005). Despite strong evidence against this proposition (Lerman 2008), this idea is taken seriously and has led to the creation of the Common Core standards at the high school level. The curriculum is in the process of implementation and is likely to crowd out occupation-based programs.

The evidence strongly suggests that occupational and nonacademic skills are far more significant from the employer perspective than are exposure to high-level academic courses. For example, data from a survey asking a representative sample of U.S. workers what skills they use on the job (Handel 2007) indicate that only 19 % use the skills developed in Algebra I, only 9 % use the skills for Algebra II, and less than 15 % of workers ever write anything five pages or more. On the other hand, upper blue-collar and even lower blue-collar workers need to know how to read and create visuals, such as maps, diagrams, floor plans, graphs, or blueprints—skills typically learned in occupation-specific courses. Moreover, certain nonacademic skills are clearly critical. Workers report the importance of problem-solving and communication skills, teaching and training other workers, dealing with people in tense situations, supervising other workers, and working well with customers.

One useful categorization of these skills comes from the 1992 Secretary's Commission on Achieving Necessary Skills (SCANS) report in the U.S. After researching the literature, consulting with experts, and conducting detailed interviews with workers and/or supervisors in 50 occupations, SCANS identified five groups of workplace competencies: the ability to allocate resources (time, money, facilities); interpersonal skills (such as teamwork, teaching others, leadership); the ability to acquire and use information; understanding systems; and working well with technology. The key personal qualities highlighted by SCANS and many surveys of employers include responsibility, self-esteem, sociability, self-management, and integrity and honesty. Hanover Research (2011) provides an updated analysis of lists of various twenty-first century generic skills.

In a survey of 3,200 employers that focused on four large metropolitan areas in the U.S., the responses indicated that such personal qualities as responsibility, integrity, and self-management are as important as basic skills or more so (Holzer 1997). In another large survey undertaken in the mid-1990s of 3,300 businesses (the National Employer Survey), employers ranked attitude, communication skills, previous work experience, employer recommendations, and industry-based credentials above years of schooling, grades, and test scores (Zemsky 1997). In a 2007 survey of employers in Washington state, about 60 % of employers reported difficulty in hiring (Washington State Workforce Training and Education Coordinating Board 2008). They experienced less difficulty finding workers with adequate reading, writing, and math skills than with appropriate occupational, problem solving, teamwork, communication, and adaptability skills as well as positive work habits and a willingness to accept supervision. Punctuality, reliability, and avoidance of drug and alcohol abuse are also critical. In a 2002 survey of 27,000 employers in the United

Kingdom, 23 % of employers reported a significant number of their staff were less than fully proficient in their jobs. Skill shortfalls were most common in communication, teamwork, other technical and practical skills, customer handling, and problem solving and least common in numeracy and literacy (Hillage et al. 2002).

Evidence confirming the importance of noncognitive/nonacademic skills has been accumulating in academic literature as well. Heckman et al. (2006) find that except in the case of college graduates, noncognitive skills (as measured by indices of locus of control and self-esteem) exert at least as high an impact—and probably a higher one—on job market outcomes than do cognitive skills (word knowledge, paragraph comprehension, arithmetic reasoning, mathematical knowledge, and coding speed as measured by the Armed Forces Vocational Aptitude Battery).

In a recent study, Lindqvist and Vestman (2011) document the differential impacts of cognitive and what they term as noncognitive skills on the earnings of Swedish men. They used special data on a representative sample of the Swedish male population matched with education, earnings, and information on cognitive and noncognitive skills obtained in the military enlistment process through interviews with psychologists. Persistence, social skills, and emotional stability were the key noncognitive skills measured and scored from the interview. Lindqvist and Vestman found that cognitive and noncognitive skills are both positively related to employment and earnings. In the low to mid ranges of skills, noncognitive skills exert a higher impact on wages than do cognitive skills.

The sociocultural approach provides some revealing examples of how skills are used in context and how nonacademic skills are often developed and used as part of a "community of practice" (Stasz 2001). Nelsen (1997) points out that workplaces not only require formal knowledge—facts, principles, theories, math, and writing skills—but also informal knowledge—embodied in heuristics, work styles, and contextualized understanding of tools and techniques (Nelsen 1997). In her revealing case study of auto repair workers, Nelsen argues that social skills of new workers are very important for learning the informal knowledge of experienced workers, such as captured in stories, advice, and guided practice. Unfortunately, according to Nelsen, the social skills learned at school are not necessarily the same as the ones most useful at work.

What about occupational skills? Often, firms, labor representatives, and government reach agreement on what is required for a qualification that will allow employers to have confidence in the capabilities of their young workers. In several countries, skill requirements for occupations develop through the operation of apprenticeship programs and other training programs. Sometimes, the occupational qualifications fit within a broad framework of national vocational qualifications running from basic to intermediate to advanced levels (for a review of national qualification frameworks in Europe, see Cedefop 2012).

Taking a Look at Other Nations

In the United Kingdom, the National Vocational Qualification (NVQ) system specifies requirements for proficiency that vary widely across types of occupations and over levels within occupations.[5] It is a modular system that recognizes workplace learning and competence based on evidence of performance at the workplace. The NVQ system takes skill gradations in each defined field into account and allows workers to gain documentation for each level, whether attained with one employer or many. The ultimate goal is that employers place a value on attaining a qualification level, giving workers an incentive to learn on the job. Although this system has not worked as effectively as planned (Eraut 2001), the NVQ approach offers one example of how certifying the attainment of skills can provide the basis for measuring the heterogeneity of skills.

One effort to develop occupational or industry standards in the U.S.—the National Skill Standards Board (NSSB)—failed to develop relevant, rigorous, portable, and well-recognized skill standards to guide training and provide reliable signals to worker and employers. However, occupation-specific skills standards exist in the U.S. through state-level licensing and certification. These forms of occupation qualifications are expanding. Today, about one in five workers requires a state license to practice his or her occupation, up from less than 5 % in the early 1950s (Kleiner 2006). Much of this increase has resulted from rapid growth in traditionally licensed occupations such as physicians, dentists, and attorneys. But the number of licensing laws has been increasing as well. In the U.S., licensing rules vary widely across states, with many states regulating occupations as varied as alarm contractor, auctioneer, manicurist, and massage therapists. Although licenses ostensibly offer some quality assurance to consumers among all providers, Kleiner finds evidence of licensure playing more of a role in raising prices than assuring quality.

School-based and dual work-based/school-based systems try to ensure that occupational qualifications are widely accepted by employers. In primarily school-based programs, decisions about what is necessary to prepare young people for particular careers are often made by the faculty of postsecondary institutions. Often, training colleges—such as U.S. community colleges and for-profit schools—decide themselves (sometimes in consultation with potential employers) what constitutes qualifications in quite detailed occupations, such as domestic air conditioner and furnace installer, medical receptionist, and medical coder.[6] Other standards directly involve employers and government entities.

Occupational standards are prerequisites for the functioning of apprenticeship programs, which involve work- and school-based learning leading to a credential

[5] For an overview on NVQ and other qualification systems in the United Kingdom, see material provided by the Qualifications and Learning Authority at http://www.qca.org.uk

[6] Curricula for certificates in these occupations appear in the catalog for the Kentucky technical college system. See http://kctcs.edu/en/students/programs_and_catalog.aspx

documenting the individual's occupational qualifications. This issue has been tackled abroad in a variety of ways. Australia has developed the national Training Package (collections of competency standards gathered into qualifications) for all industry areas, while previously qualifications were only available in a limited range of occupations and industries (Smith 2012). The development of Training Packages is one activity of the nation's ten national Industry Skills Councils. In Canada, the Interprovincial Standards Red Seal Program helps develop occupational standards that allow for effective harmonization of apprenticeship training and assessment in each province and territory (Miller 2012). The Red Seal program's standards incorporate essential skills (reading, document use, writing, numeracy, oral communication, thinking, digital technology, and lifelong learning), common occupational skills (that apply to a small range of occupations), and specific occupational skills.[7]

In England, the Sector Skills Councils and their employers design the content of each apprenticeship using the design principles of a national Apprenticeship Blueprint (Miller 2012). The secretary of state appoints and Sector Skills Councils commission an Issuing Authority to promulgate standards for specific apprenticeships. As of 2012, there were 200 operating apprenticeship frameworks and an additional 118 under development. At the same time, employers have considerable flexibility in implementing their apprenticeship programs. France uses Apprenticeship Training Centers to help design and deliver the classroom-based components of apprenticeship, with skill standards often developed by Professional Consultative Committees (Dif 2012). They operate under frameworks established by the National Commission for Vocational Qualifications.

In Switzerland, the Federal Office for Professional Education and Technology, together with cantons, employers, trade associations, and unions, participate in framing the occupational standards for about 250 occupations (Hoeckel et al. 2009). The canton vocational education programs implement and supervise the vocational schools, career guidance, and inspection of participating companies and industry training centers. Professional organizations develop qualifications and exams and help develop apprenticeship places. Occupational standards in Germany are determined primarily by the "social partners," including government, employer, and employee representatives (Hoeckel and Schwartz 2009). The chambers of commerce advise participating companies, register apprenticeship contracts, examine the suitability of training firms and trainers, and set up and grade final exams.

The content of skill requirements in apprenticeships includes academic courses and structured work-based training. In each field, the requirements are to complete the coursework in a satisfactory manner and demonstrate the apprentice's ability to master a range of tasks. In some systems, there are a set of general tasks that apply to a family of occupations (say, metalworking) and tasks that apply to a specific occupation (say, tool mechanics or metal construction and shipbuilding). While the tasks vary widely across occupations, all involve the application of concepts and academic competencies.

[7] See the documents linked at http://www.red-seal.ca/tr.1d.2@-eng.jsp?tid=51 for examples.

The coverage of occupational standards for apprenticeship extends well beyond the traditional construction crafts. In the U.K., for example, specific apprenticeships are available within such broad categories as business, administration and law; arts, media, and publishing; health and public services; retail and commercial enterprise; and information technology and communication. Common apprenticeships in Switzerland include information technology specialists, commercial employees, pharmacy assistants, and doctor's assistants. German standards cover over 300 occupations, including lawyer's assistants, bank staff workers, industrial mechanics, industrial managers, retail workers, commercial sales, and computer networking. While much of the training is specific to the occupation, nearly all fields learn skills in closely related occupations. For example, apprentices in industrial management learn accounting, procurement, production planning, staffing, and logistics.

The ability to raise the quality of jobs and workers across occupations appears to help achieve relatively low levels of wage inequality. The enhanced occupational skills and productivity result in increased wages for workers who in other societies have low or average wages. As of the mid-1990s, the evidence showed wage inequality was especially low in countries that used apprenticeships extensively, including Austria, Germany, and Switzerland (Martins and Pereira 2004).

The Timing and Flexibility of Apprenticeship Training

Countries have developed a variety of approaches for training workers to become effective in intermediate level occupations—those that require considerable skill but not a B.A. degree. Systems vary with respect to the level and duration of general education, the timing of occupation-specific education and training, and the split between classroom- and work-based learning. Waiting too long to incorporate occupation-focused education and training runs the risk of high levels of disengaged students and forcing a highly academic approach on many students who would do better in a more concrete setting that emphasizes applications. This argument is especially strong to the extent that school requirements are poorly matched to the job market opportunities facing most young people.

On the other hand, beginning an occupation-focused program too early might trap youth in unrewarding fields and limit their adaptability and upward mobility. Work-based learning is appealing, but critics worry that the training will be too specific and firms will fail to offer sufficient positions. Still, several countries train skilled craftsmen through apprenticeships. However, for many other occupations, some systems rely entirely on school-based systems and some on work-based apprenticeship models that incorporate some classroom instruction.

Although discussions of skill preparation systems generally focus on the work- vs. school-based distinction, the quality, depth, and portability of what students or apprentices learn are at least as important. The skills learned in school-based programs are not necessarily of greater general applicability than those learned in apprenticeship programs. It depends on the specifics of what is being taught and the

likelihood that the worker will stay with the training occupation or an adjacent occupation. Depending on the program's content, workers may or may not be able to sustain the gains from training when moving to another firm with the same occupation or in other occupations.

The portability of the skills learned in occupation-specific programs is a common concern about apprenticeships or any occupation-specific training. Several questions are relevant. How likely is the worker to stay in the occupation and/or with the firm? Will the worker be able to sustain the gains from training when moving to another firm but staying in the same occupation? How transferable are the skills learned to other occupations? How do the earnings gains of workers trained in occupation-specific programs compare with those of workers receiving only general postsecondary education?

How skill portability varies with the mode of learning and the curricula is unclear, a priori. As Geel and Gelner (2009) point out, learning even a highly specific skill can yield benefits outside the narrow occupation.

For example, an adolescent who wants to become a clockmaker should not necessarily be considered poorly equipped for future labor market requirements, even though his industry is small and shrinking. Rather, he is well equipped because his skill combination is very similar to skill combinations of other occupations in a large and growing skill cluster, which includes, for example, medical technicians or tool makers. Despite a seemingly very narrow and inflexible skill combination in his original occupation, he is nonetheless very flexible and well prepared for future labor market changes due to the sustainability of his acquired skills and his current skill cluster.

To operationalize the concept of skill specificity, Geel and Gelner (2009) and Geel et al. (2011) begin with an insight borrowed from Lazear (2009) that all skills are general in some sense, and occupation-specific skills are composed of various mixes of skills. The authors compile the key skills and their importance for nearly 80 occupations. They then use cluster analysis to estimate how skills are grouped within narrow occupations. This approach recognizes that skills ostensibly developed for one occupation can be useful in other occupations. It identifies occupational clusters that possess similar skill combinations within a given cluster and different skill combinations between clusters. Next, indices for each narrow occupation measure the extent to which the occupation is relatively portable between occupations within the same cluster and/or relatively portable between the initial occupation and all other occupations. The authors use these indices to determine how portability affects mobility, the wage gains and losses in moving between occupations, and the likelihood that employers will invest in training.

The authors test their hypotheses on the basis of empirical analyses of German apprentices. One finding is that while only 42 % of apprentices stay in their initial occupation, nearly two-thirds remain with either the occupation they learned as an apprentice or another occupation in the cluster using a similar mix of skills. Second, those trained in occupations with more specific skill sets are most likely to remain in their initial occupation or move to occupations within the same cluster. Third, apprentices actually increase their wages when moving to another occupation within

the same cluster but lose somewhat when moving to another cluster. Fourth, as Geel et al. (2011) show, employers are especially likely to invest in apprenticeships with the most specific skill sets.

Other strong evidence of the high returns and transferability of German apprenticeship training comes from Clark and Fahr (2001). They examine the returns to apprenticeship for those who remain in the original apprentice occupation as well as losses that do or would occur from transferring to another occupation. The overall rates of return to each year of apprenticeship range from 8 to 12 % for training in firms of 50 workers or more and from about 5.5 to 6.5 % for firms of two to 49 workers. Transferring to another occupation can offset these gains, but the reduction is zero for those who quit and only 1.7 % for those who are displaced from their job and shift to another occupation.

As found by Geel and Gellner (2009), the wage penalty varies with the distance from the original occupation. There is no penalty at all from displacement into a somewhat related occupation. Göggel and Zwick (2012) show the net gains or losses from switching employers and occupations differ by the original training occupation, with apprentices in industrial occupations actually experiencing wage advantages, while those in commerce, trading, and construction see modest losses. Finally, Clark and Fahr (2001) present workers' own views on their use of skills learned in apprenticeship training on their current jobs. Not surprisingly, 85 % of workers remaining within their training occupation use many or very many of the skills they learned through apprenticeship. This group constitutes 55 % of the sample. But, even among the remaining 45 %, about two of five workers reported using many or very many of the skills from their apprenticeship and one in five used some of the skills. Overall, only 18 % of all former apprentices stated they used few or no skills learned in their apprenticeships.

The findings show that the skills taught in German apprenticeship training are often general. Even when bundled for a specific occupation, the skills are portable across a cluster of occupations. Moreover, apprentices are quite likely to remain in occupations that use the skills they learned in their initial occupation. Apprenticeship skills do vary in terms of specificity and portability. But when the skills are less portable, firms are more likely to make the necessary investments and workers are less likely to change occupations significantly.

The general component of training is presumably stronger in school-based programs, because they are financed by government and/or individuals themselves. For this reason, some favor school-based systems, arguing that firm-based apprenticeship training limits mobility and adaptability (Hanushek et al. 2011). Yet, it is far from clear that these programs, especially the purely academic tracks in U.S. secondary schools and U.S. community colleges, offer more mobility. A high percentage of students drop out of both academic secondary and community college programs. Also, many of the community college programs are at least as specific as apprenticeship programs. Certificate programs within community colleges are almost entirely devoted to learning a narrow occupational skill, such as courses to become a phlebotomist, childcare assistant, or plastics-processing worker. Many U.S. school-based programs take place in for-profit colleges offering narrow

programs, such as truck driving, medical assistant, and medical insurance billing and coding. Furthermore, skills often erode when they go unused. To the extent students learn general skills but rarely apply them and wind up forgetting them, their training is unlikely to offer upward mobility.

While community college and private for-profit students often take highly specific occupational courses, apprentices all take some general classroom courses. Thus, apprentice electricians learn the principles of science, especially those related to electricity. In most countries, collaboration takes place between public vocational schools and apprenticeship programs. In the U.S., apprentices often take their required "related instruction" in classes at community colleges or for-profit colleges (Lerman 2010). From this perspective, apprenticeship programs should be viewed as "dual" programs that combine work- and school-based learning, albeit with an emphasis on work-based learning.

In the case of other OECD countries, the mix of school- vs. employer-based programs used to prepare young people for careers varies widely (OECD 2009, 2010). Secondary school students in Belgium and Sweden participate at high rates in vocational education but have very low rates of participation in work-based programs. In contrast, most of the vocational education in Germany, Switzerland, and Denmark revolves around work-based learning, including apprenticeships.

Apprenticeship training is attractive in limiting the gaps between what is learned at school and how to apply these and other skills at the workplace. An extensive body of research documents the high economic returns to workers resulting from employer-led training (Bishop 1997). Transmitting skills to the workplace works well with supervisory support, interactive training, coaching, opportunities to perform what was learned in training, and keeping the training relevant to jobs (Pellegrino and Hilton 2012). These are common characteristics of apprenticeships. Employer-based training like apprenticeship often bears fruit in the form of higher levels of innovation (Bauernschuster et al. 2009), net gains to firms that train during and soon after the training, and externalities, such as benefits for other employers and the public when workers are well trained to avoid the consequences of natural or manmade disasters. Generally, apprenticeships and other forms of employer-based training are far less costly to the government. Moreover, the government generally gains by paying little for the training while reaping tax benefits from the increased earnings of workers.

What Policies Can Encourage Firms to Adopt Apprenticeship in the U.S.?

Today, apprenticeships make up only 0.2 % of the U.S. labor force, far less than the 2.2 % in Canada, 2.7 % in Britain, and 3.7 % in Australia and Germany. In addition, government spending on apprenticeships is tiny compared with spending by other countries as well as compared with what it costs to pay for less effective career and

community college systems that provide education and training for specific occupations. While total government funding for apprenticeship in the U.S. is only about $100 to $400 per apprentice annually, federal, state, and local government spending annually per participant in two-year public colleges is approximately $11,400 (Cellini 2009). Not only are government outlays sharply higher, but the cost differentials are even greater after accounting for the higher earnings (and associated taxes) of apprentices compared to college students. Given these data, we can attribute at least some of the low apprenticeship penetration to a lack of public effort in promoting and supporting apprenticeship and to heavy subsidies for alternatives to apprenticeship.

However, the historical reasons for apprenticeship's low penetration in the U.S. are less important than the potential for future expansion.[8] Recent experience in Britain and in selected areas in the U.S. suggests grounds for optimism, but the barriers to expansion are significant.

One is limited information about apprenticeship. Because few employers offer apprenticeships, most employers are unlikely to hear about apprenticeships from other employers or from workers in other firms. Compounding the problem is both the difficulty of finding information about the content of existing programs and the fact that developing apprenticeships is complicated for most employers, often requiring technical assistance that is minimal in most of the country. Experiences in England and South Carolina demonstrate that effective marketing is critically important for expanding the number of firms offering apprenticeships.

Another barrier is employer misperceptions that apprenticeship will bring in unions. There is no evidence that adopting an apprenticeship program will increase the likelihood of unionization, but reports about such close links persist. An additional barrier is the asymmetric treatment of government postsecondary funding, with courses in colleges receiving support and courses related to apprenticeship receiving little financial support. Policies to reduce the government spending differentials between college subsidies and apprenticeship subsidies can help overcome this barrier.

Another significant complication to developing more apprenticeships is that U.S. apprenticeships are categorized in three different ways: registered apprenticeships with the Department of Labor's Office of Apprenticeship (OA), unregistered apprenticeships, and youth apprenticeships. Official data generally fail to track unregistered apprenticeships; evidence suggests their numbers exceed registered apprenticeships.[9] Small youth apprenticeship programs operate in a few states. Tiny budgets and an excessive focus on construction have hampered expansion of the registered apprenticeship system. The federal government spends less than $30 million annually to supervise, market, regulate, and publicize the system. Many states

[8] For a detailed look at the barriers to expanding apprenticeship in the U.S., see Lerman (2013).

[9] Data from the combined 2001 and 2005 National Household Education Surveys indicate that 1.5 % of adults were in an apprenticeship program in the prior year (NCES 2008). If these data were accurate, the number of unregistered apprentices would far exceed registered apprenticeship.

have only one employee working under their OA. In sharp contrast, Britain spends about one billion pounds (or about $1.67 billion) annually on apprenticeship, which would amount to nearly $8.5 billion in the U.S., after adjusting for population.

Unlike programs in Austria, Germany, and Switzerland, the U.S. apprenticeship system is almost entirely divorced from high schools and serves very few workers under 25. Only a few states, notably Georgia and Wisconsin, now operate youth apprenticeship programs that provide opportunities to 16- to 19-year-olds. State funding pays for coordinators in local school systems and sometimes for required courses not offered in high schools. In Georgia, 143 of 195 school systems currently participate in the apprenticeship program and serve a total of 6,776 students. These apprentices engage in at least 2,000 h of work-based learning as well as 144 h of related classroom instruction. The Wisconsin program includes one- to two-year options for nearly 2,000 high school juniors or seniors, requiring from 450 to 900 h in work-based learning and two to four related occupational courses. The program draws on industry skill standards and awards completers with a certificate of occupational proficiency in the relevant field. Some students also receive technical college academic credit. In Georgia, the industry sectors offering apprenticeships range from business, marketing, and information management to health and human services and technology and engineering. The Wisconsin youth apprenticeships are in food and natural resources, architecture and construction, finance, health sciences, tourism, information technology, distribution and logistics, and manufacturing.

Bipartisan Initiatives and New Proposals

Both the administration and some members of Congress have proposed expanded funding for apprenticeship. President Obama included $500 million per year for 4 years in his fiscal year 2015 budget. Senators Tim Scott (Republican from South Carolina) and Cory Booker (Democrat from New Jersey) have proposed providing tax credits to employers hiring apprentices.

In December 2014, the Obama administration issued a competitive grant announcement that will allocate about $100 million to expand apprenticeship.[10] The administration used its discretion to apply funds from the user fees paid by employers to hire foreign workers as part of the H-1B temporary immigration program. As a result, the grants are oriented toward expanding apprenticeships in occupations that often use H-1B workers from abroad. The industry areas include advanced manufacturing, business services, and health care. Competitors for the grant will have access to funding of $2.5 million to $5 million over 5 years. The key goal is to increase apprenticeship options for workers, but other goals include reaching out to underrepresented groups.

[10] See U.S. Department of Labor, Employment and Training Administration, Notice of Availability of Funds and Funding Opportunity Announcement for the American Apprenticeship Initiative, 2015 at http://www.dol.gov/dol/grants/FOA-ETA-15-02.pdf

Whether to emphasize apprenticeships beginning in late high school or after high school involves tradeoffs. High school programs improve the likelihood of government funding for academic courses related to apprenticeships. Given the consensus that the government should fund students through secondary school, paying for the related instruction of high school apprentices becomes a nondiscretionary part of budgets. When apprentices are beyond high school, government funding for related instruction must come out of discretionary expenses. International experience demonstrates the feasibility of youth apprenticeships; youth are able to attain serious occupational competencies while completing secondary education.

Apprenticeships in the late teenage years improve the nonacademic skills of youth at a critical time. In countries with little or no youth apprenticeship, structured work experience is less common, limiting the ability of youth to develop critical employability skills such as teamwork, communication, problem solving, and responsibility. Early apprenticeships can help engage youth and build their identity (Halpern 2009; Brown et al. 2007). Apprentices work in disciplines that are interesting and new; they develop independence and self-confidence through their ability to perform difficult tasks. Youth try out new identities in an occupational arena and experience learning in the context of production and making things.

From an economic perspective, apprenticeships for youth can be less costly for employers. Wages can be lower partly because youth have fewer medium- and high-wage alternatives and partly because youth have fewer family responsibilities, allowing them to sacrifice current for future income more easily. While Swiss firms invest large amounts of dollars in their apprenticeship programs, they pay their young apprentices very low wages during the apprenticeship period. Another economic advantage is that starting earlier in one's career allows for a longer period of economic returns to training.

For the U.S., scaling apprenticeship in the last years of high school is difficult. The aversion to tracking students too early into an occupational sequence is a common objection to youth apprenticeship. Importantly, high school officials are generally averse to adding youth apprenticeship to their already extensive agenda, including implementing Common Core standards and school and teacher accountability standards as well as dealing with charter schools and vouchers. In the early 1990s, opposition to youth apprenticeship in the U.S. came from unions and others who worried about eroding the apprenticeship brand with less intensive training programs.

To build a robust apprenticeship system in the U.S., even with new resources, the strategies will require branding at the state and/or federal levels and marketing at both the general and the firm level. I suggest five strategies: two could be accomplished at the state level, and three would be the responsibility of the federal government.

The State Role

Develop High Level and Firm-Based Marketing Initiatives

Britain's success in expanding apprenticeships from about 150,000 in 2007 to over 850,000 in 2013 offers one example for how to create successful national and decentralized marketing initiatives. Alongside various national efforts, including the National Apprenticeship Service and industry skill sector councils, the British government provided incentives to local training organizations to persuade employers to create apprenticeships. A similar model could be developed in the U.S. state governments could build a state marketing campaign together with incentives and technical support to community colleges and other training organizations to market apprenticeships at the individual firm level. However, simply marketing to firms through existing federal and state agencies may not work if the staff lacks the marketing dynamism, sales talent, and passion for expanding apprenticeship. Pay for performance is recommended: Technical education and training organizations would earn revenue only for additional apprenticeships that each college or organization managed to develop with employers.

Every apprenticeship slot stimulated by the college/training organization increases the work-based component of the individual's education and training and reduces the classroom-based component. Assume the work-based component amounts to 75 % of the apprentice's learning program and the school-based courses are only 25 % of the normal load for students without an apprenticeship. By allowing training providers to keep more than 25 % of a standard full-time-equivalent cost provided by federal, state, and local governments in return for providing the classroom component of apprenticeship, the community colleges and other training organizations would have a strong incentive to develop units to stimulate apprenticeships. State and local governments could provide matching grants to fund units within technical training organizations to serve as marketing arms for apprenticeships. The marketing effort should encourage government employers as well as private employers to offer more apprenticeships.

South Carolina's successful example involved collaboration between the technical college system, a special unit devoted to marketing apprenticeship, and a federal representative from the Office of Apprenticeship. With a state budget for Apprenticeship Carolina of $1 million per year as well as tax credits to employers of $1000 per year per apprentice, the program managed to stimulate more than a sixfold increase in registered apprenticeship programs and a fivefold increase in apprentices. Especially striking is that these successes—including 4000 added apprenticeships— took place as the economy entered a deep recession and lost millions of jobs. The costs per apprentice totaled only about $1250 per apprentice calendar year, including the costs of the tax credit.

Build on Youth Apprenticeship Programs

State government spending on youth apprenticeship programs amounts to about $3 million in Georgia and $2 million in Wisconsin. Although these programs reach only a modest share of young people, the U.S. could make a good start on building apprenticeship if the numbers in Georgia could be replicated throughout the country. The focus would be on students who perform better in work- than purely school-based settings and are less likely than the average student to attend college or complete a B.A. degree. To create about 250,000 quality jobs and learning opportunities, the gross costs of such an initiative would be only about $105 million, or about $450 per calendar year, or about 4 % of current school outlays per student-year. Moreover, some of these costs would be offset by reductions in teaching expenses, with more students spending greater amounts of time in work-based learning and less time in high school courses. Having fewer students have to repeat grades will save costs as well. In all likelihood, the modest investment would pay off handsomely in the form of increased earnings and associated tax revenues as well as reduced spending on educational and other expenditures.

Good places to start are career academies—schools within high schools that have an industry or occupational focus—and regional career and technical education (CTE) centers. Over 7,000 career academies operate in the U.S. in fields ranging from health and finance to travel and construction (Kemple and Willner 2008). Career academies and CTE schools already include classroom-related instruction and sometimes work with employers to develop internships. Because a serious apprenticeship involves learning skills at the workplace at the employer's expense, these school-based programs would be able to reduce the costs of teachers relative to a full-time student. If, for example, a student spent two days per week in a paid apprenticeship or 40 % of time otherwise spent in school, the school should be able to save perhaps 15–30 % of the costs. Applying these funds to marketing, counseling, and oversight for youth apprenticeship should allow the academy or other school to stimulate employers to provide apprenticeship slots. Success in reaching employers will require talented, business-friendly staff who are well trained in business issues and apprenticeship.

To implement this component, state governments should fund marketing and technical support to career academies to set up cooperative apprenticeships with employers, either using money from state budgets or federal dollars. The first step should be planning grants for interested and capable career academies to determine who can best market to and provide technical assistance to the academies. Next, state governments should sponsor performance-based funding to units in academies so they receive funds for each additional apprenticeship. Private foundations should offer resources for demonstration and experimentation in creating apprenticeships within high school programs, especially career academies.

The Federal Role

Extend Use of Current Postsecondary and Training Subsidies to Apprenticeship

In nearly all other countries, the government is responsible for the classroom-based component of apprenticeship. One approach to making this jump in the U.S. is to use existing postsecondary programs to finance or at least subsidize the classroom portion of apprenticeships. Already, localities can use training vouchers from the Workforce Investment Act for apprenticeship. To encourage greater use of vouchers for apprenticeship, the federal government could provide one to two more vouchers to Workforce Investment Boards for each training voucher used in an apprenticeship program. Another step is to encourage the use of Trade Adjustment Act (TAA) training subsidies to companies sponsoring apprenticeships just as training providers receive subsidies for TAA-eligible workers enrolled in full-time training. In addition, policies could allow partial payment of TAA's extended unemployment insurance to continue for employed individuals in registered apprenticeship programs.

Allowing the use of Pell grants to pay at least for the classroom portion of a registered apprenticeship program makes perfect sense as well. Currently, a large chunk of Pell grants pays for occupationally oriented programs at community colleges and for-profit career colleges. The returns on such investments are far lower than the returns to apprenticeship. The Department of Education already can authorize experiments under the federal student aid programs (Olinsky and Ayres 2013), allowing Pell grants for some students learning high-demand jobs as part of a certificate program. Extending the initiative to support related instruction (normally formal courses) in an apprenticeship could increase apprenticeship slots and reduce the amount the federal government would have to spend to support these individuals in full-time schooling.

The GI Bill already provides housing benefits and subsidizes wages for veterans in apprenticeships. However, funding for colleges and university expenses is far higher than for apprenticeship. Offering half the GI Bill college benefits to employers hiring veterans into an apprenticeship program could be accomplished by amending the law. However, unless the liberalized uses of Pell grants and GI Bill benefits are linked with an extensive marketing campaign, the take-up by employers is likely to be limited.

Designate Best Practice Occupational Standards for Apprenticeships

To simplify the development of apprenticeships for potential employers, a joint Office of Apprenticeship-Department of Commerce team should designate one or two examples of good practice with regard to specific areas of expertise learned at work sites and subjects learned through classroom components. The OA-Commerce

team should select occupational standards in consultation with selected employers who hire workers in the occupation. Once selected, the standards should be published and made readily accessible. Employers who comply with these established standards should have a quick and easy path to registration of the program. In addition, workforce professionals trying to market apprenticeships will have a model they can sell and that employers can adopt and/or use with modest adjustments. Occupational standards used in other countries can serve as starting points to the Labor-Commerce team and to industry groups involved in setting standards and in illustrating curricula.

Develop a Solid Infrastructure of Information, Peer Support, and Research

The federal government should sponsor the development of an information clearinghouse, a peer support network, and a research program on apprenticeship. The information clearinghouse should document the occupations that currently use apprenticeships not only in the U.S. but also in other countries along with the list of occupation skills that the apprentices master. It should include the curricula for classroom instruction as well as the skills that apprentices should learn and master at the workplace. Included in the clearinghouse should be up-to-date information on available apprenticeships and applicants looking for apprenticeships. The development of the information hub should involve agencies within the Department of Commerce as well as the OA.

The research program should cover topics especially relevant to employers, such as the return to apprenticeship from the employer perspective and the net cost of sponsoring an apprentice after taking account of the apprentice's contribution to production. Other research should examine best practices for marketing apprenticeship, incorporating classroom and work-based learning by sector, and counseling potential apprentices.

Conclusions

Expanding apprenticeship is a potential game-changer for improving the lives of millions of Americans and for preventing further erosion of the middle class. Apprenticeships widen routes to rewarding careers by upgrading skills, including occupational skills but also math, reading, and employability skills. Taking math, reading, and writing in the context of using these competencies in the workforce will increase the motivation of many workers and the efficacy of the delivery process. Given the ability of workers to learn more, remain well motivated, and notice how to make innovations at the workplace, firms will have an increased incentive to adopt "high road" strategies and make them work. Such an approach may be one of the only ways the firm can attract and sustain workers.

Apprenticeships can also increase the efficiency of government dollars spent on developing the workforce. Instead of spending over $11,000 per year on students in community college career programs, why not shift resources toward far more cost-effective apprenticeship programs? Apprenticeship programs yield far higher and more immediate impacts on earnings than community or career college programs yet cost the student and government far less. Community college graduation rates, especially for low-income students, are dismally low. Even after graduating, individuals often have trouble finding a relevant job. For students in postsecondary education, foregone earnings are one of the highest costs. In contrast, participants in apprenticeships rarely lose earnings and often earn more than if they did not enter an apprenticeship. Further, apprentices are already connected with an employer and can demonstrate the relevant credentials and work experience demanded by other employers. Another advantage is the net gains flowing to employers from apprenticeship programs.

The key question is not whether the shift in emphasis from community and/or career colleges toward apprenticeships is desirable but whether it is feasible. Although some argue that the free U.S. labor market and the weak apprenticeship tradition pose insurmountable barriers to scaling apprenticeship, the dramatic increases in apprenticeship in Britain offer strong evidence that building a robust apprenticeship program in the U.S. is possible.

We are well along with the task of persuading policy makers about the desirability and feasibility of apprenticeship. With the Obama administration's grants for the American Apprenticeship Initiative, as of this writing, we were expecting a mix of approaches beginning in the summer of 2015 aimed at expanding apprenticeship. In addition, employers would learn about the returns to apprenticeship as a result of their own experience and expected evaluations. Still, structural barriers remain that limit the development of a robust apprenticeship system in the U.S.

It is past time for federal and state governments to make a genuine effort to build an extensive and high value apprenticeship system. Without such an effort, we will never know whether U.S. employers will follow the patterns of other countries, create a significant number of apprenticeship slots, and recognize the gains to firms from such investments if we do not try. Institutional change of this magnitude is difficult and will take time but will be worthwhile in increasing earnings of workers in middle-skill jobs, widening access to rewarding careers, enhancing occupational identity, increasing job satisfaction, and expanding the middle class.

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Kentucky's Journey

with Registered Apprenticeship 2017-18

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Kentucky's Division of Apprenticeship Transitions to the Education and Workforce Development Cabinet

Posted July 18th, 2018 by Think Kentucky

FRANKFORT, Ky. (July 18, 2018) - The Kentucky Education and Workforce Development Cabinet (KEWDC) today announced the transition of the Division of Apprenticeship from the Kentucky Labor Cabinet to KEWDC's Office of Employment and Training. The division, in cooperation with the U.S. Office of Apprenticeship and Training, oversees the Commonwealth's registered apprenticeship program.

Kentucky's registered apprenticeship program is rapidly becoming a national model in preparing individuals to successfully enter the workforce. Today's administrative move will build upon this momentum by harnessing KEWDC's existing statewide network to connect employers with potential employees and to provide increased apprenticeship opportunities for Kentuckians.

"This action will ensure that our registered apprenticeship program continues to be an invaluable plank within the overall platform of workforce development in the Commonwealth," noted Gov. Matt Bevin in his executive order. "It allows us to expand our growing apprenticeship program to its fullest potential by pairing it with the infrastructure and resources of the Office of Employment and Training within the Education and Workforce Development Cabinet."

Today's announcement follows a call from Gov. Bevin earlier this year urging the Labor Cabinet, Public Protection Cabinet and the Education and Workforce Development Cabinet to partner on ways to further enhance workforce development efforts within the Commonwealth.

"This is a great day for workers and employers in the Commonwealth," said Education and Workforce Development Cabinet Secretary Derrick Ramsey. "By bringing the Division of Apprenticeship over to the Education and Workforce Development Cabinet, it will allow us to leverage resources that train Kentucky citizens and integrate them into the workforce. This move will enhance the pipeline between education and workforce to give employers quicker access to a large pool of skilled employees."

Currently, there are over 3,000 apprentices in Kentucky in nearly 240 different programs representing 109 different occupations.

The Registered Apprenticeship model is a flexible, employer-driven approach that provides high-quality job training and produces skilled, competent employees for Kentucky employers. The division is responsible for registering apprenticeship programs that meet federal standards, issuing nationally recognized and portable Certificates of Completion to apprentices, and promoting the development of new programs through marketing and technical assistance.

Earlier this year, the Division of Apprenticeship joined Gov. Bevin, the Cabinet for Health and Family Services, the Personnel Cabinet, and the Department of Education to announce the first apprenticeship program for state-employed social service workers in the country.

Later this year, KEWDC will host the second annual Kentucky Registered Apprenticeship Summit in Louisville from Sept. 10 – 12. The goal of the summit is to bring together apprenticeship stakeholders with business, education and civic leaders from across the Commonwealth and beyond to discuss ways this proven training model is transforming the state's workforce. For more information or to register for the summit, click here.

Information on Kentucky's economic development efforts and programs is available at www.ThinkKentucky.com. Fans of the Cabinet for Economic Development can also join the discussion on Facebook at or follow on Twitter at . Watch the Cabinet's "This is My Kentucky" video on YouTube.

The Kentucky Cabinet for Economic Development is the primary state agency responsible for encouraging new jobs and investment in the state. New capital investment announced in Kentucky in 2017 totaled a state record $9.2 billion, spurring more than 17,200 projected new jobs. Information on available industrial properties, workforce development assistance, incentive programs, community profiles, small business development and other economic development resources is available at www.ThinkKentucky.com.

Kentucky Awarded Nearly $1.1 Million Grant for Apprenticeships

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FRANKFORT, Ky. (June 13, 2018) – The U.S. Dept. of Labor (USDOL) has announced that the Kentucky Labor Cabinet has been awarded $1,085,871 under the ApprenticeshipUSA State Expansion Grant Initiative to continue efforts to grow Registered Apprenticeships throughout the Commonwealth.

"Receiving this funding is a testament to the success we've had expanding Registered Apprenticeships across the state and countless opportunities that lie ahead of us," Deputy Secretary Mike Nemes said. "We have seen tremendous growth in the awareness of apprenticeships, and in time, an unprecedented amount of engagement from business leaders who are seeking ways to implement this training model. For Kentucky to fully realize itself as the engineering and manufacturing hub of excellence in North America, we must continue to look for ways to expand apprenticeships to new locations, industries, and within all populations of our workforce. With this funding, we will continue to achieve important milestones while providing a new trajectory for Kentucky's workforce."

The purpose of this round of funding is to enable Kentucky to establish and grow "intermediaries," or third-party organizations to better connect apprentices with employers; engage employers new to the state or new to Registered Apprenticeships; compensate businesses for expenses related to required training instruction; and, to diversify the pool of apprentices in Kentucky.

The Labor Cabinet has received two prior awards from the USDOL, including the Accelerator Planning Grant and the $896,000 AppreinticeshipUSA State Expansion Grant, together totaling in excess of $1 million. This funding has allowed the Office of Registered Apprenticeship to:

· Increase the number of businesses offering Registered Apprenticeships by over 50 percent;

· Increase the number and diversity of apprentices working in the Commonwealth's businesses and industries statewide;

· Diversify the sectors and occupations available to apprentices, thereby modernizing a skilled workforce pipeline necessary for a thriving, competitive economy;

· Work with the Personnel Cabinet to create apprentice positions available to state government agencies;

· Develop a range of local, state, national and international partnerships, ensuring innovative workforce models meet the needs of an increasingly global economy;

· Launch cutting-edge IT programs in areas impacted by loss of jobs in the coal mine industry; and,

· Convene the largest event devoted to apprenticeship in the Commonwealth's history.

The ApprenticeshipUSA State Expansion Grant Initiative was launched by the USDOL in April of 2016 by awarding 37 participating states over $50.5 million in grant awards to increase the number apprentices in numerous underrepresented populations, including: women, minorities, 16-24 year

olds, individuals age 45+ or older, veterans, and people with disabilities. In addition to targeting growth within these groups, this initiative encourages states to target the healthcare, construction, transportation and logistics, energy, manufacturing, and information and communications technology sectors.

Currently, there are over 3,000 apprentices in Kentucky in nearly 240 different programs and in 109 different occupations. Last month, the Labor Cabinet joined Gov. Bevin, the Cabinet for Health and Family Services, the Personnel Cabinet, and the Dept. of Education to announce the first apprenticeship for state-employed social service workers in the country.

Later this year, the Labor Cabinet will host the second annual Kentucky Registered Apprenticeship Summit in Louisville from September 10 – 12. The goal of the Summit is to bring together apprenticeship stakeholders with business, education and civic leaders from across the Commonwealth to discuss ways to grow and improve apprenticeships in Kentucky. It is the state's largest gathering for those interesting in learning more about apprenticeships, and registration information can be found here.

The Labor Cabinet acts as the governing body for Registered Apprenticeships in Kentucky, and provides technical and consultative services to employers. "Kentucky Trained. Kentucky Built." was launched in 2016 and is a campaign under the Division of Apprenticeship to signal the Labor Cabinet's commitment to new energy and resources to strengthen and grow Registered Apprenticeships across the Commonwealth. For more information on Registered Apprenticeships in Kentucky, click here.

Follow the Kentucky Labor Cabinet on Facebook and Twitter for all the latest updates.

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Commonwealth of Kentucky
Governor's Office

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Kentucky Launches First-of-Its-Kind Apprenticeship Program for Social Services

Collaborative program enhances job skills and opportunities

FRANKFORT, Ky. (May 15, 2018) – Gov. Bevin today announced an innovative new registered apprenticeship pilot program aimed at strengthening social services careers throughout the Commonwealth.

Labor Secretary Derrick Ramsey, Health and Family Services Acting Secretary Scott Brinkman, Personnel Secretary Tom Stephens, Department for Community Based Services (DCBS) Commissioner Adria Johnson, and Associate Commissioner for the Office of Career and Technical Education (OCTE) Laura Arnold joined Gov. Bevin to launch the program, which will provide increased opportunities for individuals pursuing a social services career in state government.

One of the first of its kind in the country, this initiative will offer paid apprenticeship opportunities in local Protection and Permanency and Family Support offices within DCBS, part of the Cabinet for Health and Family Services (CHFS).

The program will offer apprenticeships to young adults who are interested in pursuing a career in social services but may not have the opportunity to go to college, have never considered secondary education, or are impacted by generational poverty.

“Whether it’s a junior in high school who is dreaming of a career that gives back to the community, or a college student looking for a pathway into the social services field, this apprenticeship program will fundamentally change the way that the Commonwealth of Kentucky recruits and trains public servants for rewarding careers within DCBS,” said Gov. Bevin. “Apprenticeships are a proven training model that will enhance the way we provide social services throughout the Commonwealth, and we are exploring other areas where we can further use this program to recruit and retain the next generation of public servants in Kentucky.”

The pilot program began earlier this year as a co-op for high school students interested in social services careers. Curriculum will require a minimum of 144 classroom and 2,000 to 3,000 on-the-job training hours per year and will include opportunities within DCBS offices in Frankfort and across the state. In addition to mid-career professionals, the program will be available to both high school and college students, and eligible high school juniors and seniors may enroll in the Department of Education’s Tech Ready Apprenticeship for Careers in Kentucky (TRACK) to obtain dual secondary and postsecondary credits while earning an apprenticeship wage.

TRACK students and apprentices will have the option of choosing from one of three different positions within the Protection and Permanency and Family Support offices: Office Manager/Administrative Services, Human Social Services, and Human Family Services. Participants will acquire working knowledge of each role through guided learning and rotations through each function area and position.

DCBS Commissioner Adria Johnson said the apprenticeship program is an innovative way to equip students with the tools they need to begin social services careers.

“We are so pleased to be a part of this collaboration to attract and train more social services staff,” Commissioner Johnson said. “Prospective social services workers get an in-depth education through this program – especially from pairing with our veteran front-line and central office staff. Human services is such a dynamic profession, and this apprenticeship program will help us prepare capable, compassionate caseworkers who are committed to helping Kentucky’s children and families have a better life.”

Commissioner Johnson said the apprenticeship program will help DCBS to train and retain social services staff by removing the barriers to education and training that some applicants may face. She said the program will ensure high standards for new employees who work directly with families.

“When P-12 education works together with postsecondary education and business, or in this case state government, we can pave the pathway for student’s to have successful careers after high school,” Interim Kentucky Education Commissioner Wayne Lewis said. “Through the TRACK program, students get a head start on college by taking dual credit courses while still in high school; they gain on-the-job work experience that will make them more valuable in the workplace and provide employers with qualified workers; and they can earn a paycheck that can support additional education and training. This opportunity is a win for everyone involved.”

This unique partnership between the TRACK program and the Commonwealth allows students interested in a social services career to gain experience while they are obtaining their formal education and enables DCBS to train the workforce of tomorrow while providing opportunities to current students.

The Labor Cabinet acts as the governing body for registered apprenticeships in Kentucky, and provides technical and consultative services to employers.

“The ‘Kentucky Trained. Kentucky Built.’ registered apprenticeship initiative focuses not only growing the apprenticeship model throughout the state, but engaging underserved populations to help fill critical industries in need of a shot in the arm,” Secretary Ramsey said. “This unique collaboration is helping to bring the power of apprenticeships to great careers within state government, and I applaud the DCBS for wanting to cultivate a new wave of public servants who will help move the Commonwealth forward. This program is

one of the first of its kind in the nation, and I'm excited to showcase another way that Kentucky is pioneering solutions in workforce development through innovative ideas like this one."

As the demand for skilled public employees increases, the Personnel Cabinet is looking to apprenticeships to create a pipeline for entry-level workers in a variety of areas, and the model used by DCBS can be replicated across state government agencies.

"DCBS employees provide critical services in all of Kentucky's 120 counties," said Secretary Stephens. "These critical positions are especially difficult to fill in a tight labor market. This program has the ability to change that. An apprenticeship program will help Kentuckians specifically prepare for these important jobs, and in turn, help better meet the needs of some of our most vulnerable citizens. I'm truly excited about the possibilities this program will provide."

Dr. Robert Lerman, an Institution Fellow at the Urban Institute, professor of economics at American University, and one of the nation's leading experts on apprenticeships, has long advocated for increased public investment into the apprenticeship model and praised the announcement.

"Kentucky is lucky to have outstanding leaders who are making apprenticeship expansion a top priority and who have a strong bias for action," said Dr. Lerman. "Their efforts to scale up apprenticeships will widen productive opportunities for workers while increasing the success of Kentucky's businesses and nonprofit employers."

According to the U.S. Department of Labor, for every dollar spent on apprenticeships, employers gain $1.47 in return through increased productivity, reduced waste, and greater front-line innovation.

"Simply put, apprenticeships within state government have the potential to bring important long-term cost savings to Kentucky taxpayers," Secretary Ramsey said. "Apprenticing social services positions at the DCBS is only the beginning for implementing this training model in other agencies. Today's announcement is a huge victory for children and families across the Commonwealth."

Interested Kentucky high school juniors and seniors can contact their guidance counselors to the begin the process of applying for Fall 2018 semester apprenticeships.

For all other interested applicants, please contact Tresa Straw (Tresa.Straw@ky.gov / 502-564-7770, ext. 3367) or visit the following link.

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Prestonsburg City's Utilities Commission Creates New Apprenticeship Program

Alexandria Englenalexandria.englen@ky.gov
KY

Prestonsburg, Ky. (February 13, 2018) – Labor Cabinet Deputy Secretary Mike Nemes joined officials from Prestonsburg City's Utilities Commission and Big Sandy Community and Technical College in Prestonsburg to announce the creation of a new apprenticeship program.

This three-year Registered Apprenticeship specializes in the occupations of Water Treatment Plant and Wastewater Treatment Operators. Apprentices will receive 2,000 on-the-job and 144 classroom training hours per year and will earn a nationally recognized journeyman certificate upon completion of the program.

"The Labor Cabinet is thrilled to register this innovative apprenticeship program today, and it's encouraging to see the city of Prestonsburg take this step in order to strengthen its utilities for generations to come," said Labor Cabinet Secretary Derrick Ramsey. "My hope is that more cities throughout the Commonwealth will emulate the unique partnership that exists between Prestonsburg and Big Sandy CTC in order to tackle today's important workforce challenges."

Since 1956, Prestonsburg City's Utilities Commission has extended, improved, and maintained the waterworks, sewer system, and natural gas distribution operations for the city of Prestonsburg. The Commission is a regional provider of utility services with approximately 9,000 retail water customers, nearly 3,000 retail wastewater customers, and approximately 1,100 gas customers.

"The current workforce of certified operators is an aging one that will most likely face critical shortages of certified operators in the future," said Prestonsburg City's Utilities Commission Superintendent and CEO Turner E. Campbell. "This is why today's announcement is so important for us. This program will shorten the time it takes to become a certified water or wastewater treatment operator while giving utility entities an opportunity to replace retiring operators more quickly. Today's announcement is a win for the citizens of Prestonsburg and the long-term outlook of our workforce, and we look forward to being a true partner in this program with Big Sandy Community and Technical College."

"Big Sandy Community & Technical College is proud to enter into an agreement with Prestonsburg Utilities for an apprenticeship program related to water plant training," said Big Sandy CTC President and CEO Sherry Zylka. "We are working together to develop the skills needed to create a pipeline of new workers in the future. It's a win-win situation."

The 'Kentucky Trained. Kentucky Built.' initiative signals Kentucky's recommitment of new energy and resources toward strengthening apprenticeships across Kentucky. Since November of last year, over 1,000 new apprentices statewide have been registered, bringing the total number of registered apprentices to 3,088 in 206 programs throughout Kentucky.

State Sen. Johnny Turner (Prestonsburg) and State Rep. Larry Brown (Prestonsburg) also offered praise.

“This apprenticeship program is a positive step toward providing another tool to prepare and strengthen the workforce,” said Sen. Turner. “I look forward to the implementation of this inventive partnership and its success.”

“This partnership is exactly what Prestonsburg and the Floyd County area need,” said Rep. Brown. “This vital partnership will give future Kentucky workers an advantage in the job market as they will be equipped with prior work experience to go along with their college education.”

For more information on Registered Apprenticeships, visit www.KentuckyApprenticeship.com.

Follow the Kentucky Labor Cabinet on Facebook and Twitter for all the latest updates.

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RJ Corman Railroad Group in Nicholasville Creates New Apprenticeship Program

Alexandria Englenalexandria.englen@ky.gov

KY

Frankfort, Ky. (December 6, 2017) – Labor Secretary Derrick Ramsey joined officials from RJ Corman Railroad Group in Nicholasville today to announce the creation of a new apprenticeship program.

This four-year Registered Apprenticeship focuses on developing skills as an electrician. Apprentices will receive 2,000 on-the-job and 144 classroom training hours per year and will earn a nationally recognized journeyman certificate upon completion of the program.

"In Kentucky today, employers are facing a shortage of a skilled workforce," said Labor Secretary Derrick Ramsey. "Registered Apprenticeships are the answer to this problem and businesses like RJ Corman are reinforcing their commitment to develop and retain more highly-skilled talent through these programs. I applaud RJ Corman for taking steps to bring more opportunity to their region and I look forward to the success this apprenticeship will bring to Nicholasville."

Since 1973, RJ Corman Railroad Group has served all seven North American major railroads, many regional and shortline railroads and dozens of industries utilizing rail. Services include owning and operating eleven shortlines, providing emergency rail services associated with derailments and natural disasters, switching, track construction, track material distribution, signal design/construction, building switching locomotives and operating a dinner train. RJ Corman employs over 300 people at its headquarters in Nicholasville.

"As a family owned, Kentucky-based business, we are pleased to work with the Labor Cabinet to continue to create opportunities for the citizens of the Commonwealth," said Ed Quinn, President and CEO, RJ Corman Railroad Group. "We believe that by investing in people, we can contribute to the workforce development of our state."

The 'Kentucky Trained. Kentucky Built.' initiative signals Kentucky's recommitment of new energy and resources toward strengthening apprenticeships across Kentucky. Since November of last year, 1,000 new apprentices statewide have been registered, bringing the total number of registered apprentices to 3,157 in 206 programs throughout Kentucky.

State Sen. Tom Buford (Nicholasville) also offered praise.

"I would like to thank RJ Corman Railroad Group for beginning this new, innovative apprenticeship program that will certainly benefit our community and the company alike," said Sen. Buford. "I look forward to seeing this hands-on program and its participants in action, and I wish the company the best in this new endeavor."

For more information on Registered Apprenticeships, visit www.KentuckyApprenticeship.com.

Follow the Kentucky Labor Cabinet on Facebook and Twitter for all the latest updates.

Participants
cc: Sustainable sanitation - https://www.flickr.com/photos/23116228@N07

Partial Listing of Participants
Registered Apprenticeship Summit 2018

Ervin Dimeny	Education and Workforce
Nicholas Wyman	Consultant
Dr. Deborah Williamson	
Dr. Diana Elliott	Urban Institute Consultant
Diana Jarboe	diana.jarboe@ky.gov
Robert Woodson	Elizabethtown Community and Technical College
Ann Amorose	JCTC
Demetrius Langley	JCTC
Nickie Cobb	JCTC
Brittany Corde	Maysville Community & Technical College
Brian Noll	Kenton County Academies of Innovation & Technology
Donna Davis	Kentucky Community & Technical College System
Christopher Bryson	Kenton County Academies of Innovation & Technology
Barbara Murray	TransPORTs
Randy Johnson	Morning Pointe
Katie Adams	TransPORTs
Danny Cain	Edwards Moving & Rigging
Sierra Burton	Edwards Moving & Rigging
Jeremy Faulkner	Tenco Workforce / Buffalo Trace Area Development District
Melissa Vermillion	Hazard Community and Technical College
M. Martha Slemp	KY Dept of Corrections
Elizabeth Bishop	Kentucky Cabinet for Economic Development
Brooklyn Leep	Kentucky Cabinet for Economic Development
Keila Miller	Hazard Community and Technical College
Bren Martin	UCAN, Inc
Nikole Wolfe	Kentucky Department for Libraries and Archives
Renae Lovins	Navigo and Covington Independent Schools
LaDonna Koebel	Kentucky Personnel Cabinet
Michael Hazzard	Elizabethtown Community and Technical College
Benjamin Whitlock	Elizabethtown Community and Technical College
Thomas Stevens	Montaplast
Cynthia Elliott	Client Assistance Program
Rebecca Thorpe	Hazard Community and Technical College
Donna Peek	City of Danville
Brian Lovell	Union County Public Schools
Debbie Fowler	
Brenda Line	Hart County Board of Education
Tim Ernst	East and Westbrook Construction
Francis OHara	Kenton County Public Schools
Brandon Wilson	RAME Contracting
Corey Eimer	Brighton Center
Natasha Cummings	Kentucky Career Center

Partial Listing of Participants
Registered Apprenticeship Summit 2018

Christy Rogers	Jefferson County Public Schools
Lea Martin	Hopkinsville Community College
Denise Jones	Kentucky Career Center
Greg Cobble	
Carol Kirves	Hopkinsville Community College
Diane Dougherty	KCTCS
Britney Mitchell	Madisonville Community College
Tiffanie Reeves	Bluegrass Area Development District
Beth Cassidy	Elizabethtown Community and Technical College
Kenneth Menefee	United Way of the Bluegrass
Diane Dougherty	KCTCS
John Hayden	RAME Contracting, LLC
Tara Rascoe	Hopkinsville Community College
Josh Benton	Workforce Investment
Diana Smith	Apex
Ben Kemplin	Logan County Board of Education
Jessie Schook	Greater Louisville, Inc.
Tammy Baker	Options Unlimited
Paul Mullins	Logan County Schools
Beth Frogue	Logan CTC
Gina Winchester	Workforce Solutions WKCTC
Finley Baird	Logan County Schools
Caycee Spears	Logan County Schools
Tom Curtsinger	Workforce Solutions WKCTC
Liz Brown	Old World Timber
Michael Hesketh	Superb IPC
Brad Montel	EWDC
Terry Manuel	Dept of Libraries and Archives
Beth Milburn	Dept of Libraries and Archives
Jessica Cunningham	Kentucky Center for Statistics
Tim House	DHBC
Lynn Faulkner	KAMC
Buddy Hoskinson	Commonwealth of Kentucky
Melissa Aguliar	Kentucky Workforce Innovation Board
Kim Myers	Southcentral Kentucky Community and Technical College
Nichelle Freer	Jefferson County Public Schools
Stephen Tressler	Apprenticeship
Diana Jarboe	Apprenticeship
Brenda Demic	Apprenticeship
Tracy Osborne Clay	Apprenticeship
Rick Moir	JCPS
Jim Rachlin	REI

Partial Listing of Participants
Registered Apprenticeship Summit 2018

Nicole Griffith-Green	Ashland Community and Technical College
Alaina Myers	Kentucky Personnel Cabinet
Mary Elizabeth Bailey	Kentucky Personnel Cabinet
Juanita Webb	Governor's Office of Early Childhood
Sally Shepher	Governor's Office of Early Childhood
Erin Mitchell	Governor's Office of Early Childhood
Thaddeous Peice	Dept of Education
Robert Shorter	Kentucky Career Center, Disabled Veterans
Denise King	KY Career Center
Rita Woods	Kentucky Career Center
Mike York	Kentucky Department of Education
Alesa Johnson	Somerset Community College
Eric Harris	Somerset Community College
Zakiyyah Raymore	Kentucky Manufacturing Career Center
Tonya Crum	KET
Teresa Day	KET
Beth Gaunce	KET
Trey Pippin	Daviess County Public Schools
Amanda Jerome	DCPS Public Schools
Mark Hundley	KCTCS
Amanda Pierce	Norton Healthcare
Patricia Erwin	KET
Brittany Burke	Norton Healthcare
James Turner	Commonwealth Preservation Trades
Melissa Aguilar	Kentucky Workforce Innovation Board
Christy Henry	Kentucky Workforce Innovation Board
Heath Cartwright	McCracken County Public Schools
Gale Hess	Calgon Carbon Corporation
Nikki Walker	Kentucky Manufacturing Career Center
Kelly Spaw	Apollo High School
Michael Thomas	
Nancy Salyers	Cannon Automotive Industries
Ayden Wilson	Mater Dei HS
Russ Watts	Kentucky Commission on Military Affairs
Brian Hiles	Commonwealth Office of Technology
Greg McCall	Commonwealth Office of Technology
Molly Webb	Ashalnd Community and Technical College
Allyson Foster	Dept. For Community Based Services
Michele Barnes	Justice and Public Safety Cabinet
Katie Hamilton	Kentucky State Police
Jerry Petrey	Madison County Schools
Stephanie Haney	Trilogy
Candice Johnson	Kentucky Higher Education Assistance Authority

Partial Listing of Participants
Registered Apprenticeship Summit 2018

Thad Schember	Pond View Academy
Doris Schember	Pond View Academy
Andrea Schember	Pond View Academy
Tammy Lou Wright	KY Department of Corrections
Pam McAlister	Owen Electric Coop
Julie Kuhnhein	Campbell County Schools
Shelli Wilson	Campbell County Schools
Tresa Straw	Cabinet for Health and Family Services
G. Cobble	Sons of the American Legion
Wendy Wheeler	KDVA - Radcliff Veteran Center
Brandy Small	KDVA - Radcliff Veterans Center
Donya Goode	KDVA - Radcliff Veterans Center

Reception

6:00-8:00 p.m.

cc: Brooke Lark - https://unsplash.com/@brookelark?utm_source=haikudeck&utm_medium=referral&utm_campaign=api-credit

Summit Organizer

Deborah Williamson, Ph.D.
Director
Registered Apprenticeships

A native of the Commonwealth of Kentucky, Dr. Deborah Williamson currently directs Kentucky's Registered Apprenticeship Program.

Her long-term work in state governments remains inspired in large measure by her first boss, Robert F. Stephens, Chief Justice of Kentucky's Supreme Court. Hiring Williamson straight out of graduate school at the University of Cincinnati in the late eighties, Stephens and his top leadership emphasized passion and commitment to public service, open and caring dialog among employees regardless of position, and cultivated an environment where testing innovation, routinely celebrating winning ideas and deliverables, and learning from failure was the accepted norm. Williamson enthusiastically spent the next twenty-three years employed by the Court of Justice, serving the state judiciary in an executive management role. During her two decade plus employment she managed the statewide juvenile diversion program for minor offenders, institutionalized civic and law-related education programs for youth k-12, oversaw the Court's grants program, managed judicial branch education for all tiers of the Court, organized international delegation exchanges, and provided a myriad of services to the state's elected judges and clerks. Williamson characterizes this experience as exciting, energizing and rewarding beyond career expectations, noting that the collective "we" employed by the Court made a positive and enduring impact for Kentuckians.

From 2012 to 2014, Williamson served as CEO to Chief Judge Judith K. Nakamura at the Bernalillo County Metropolitan Court in Albuquerque, New Mexico. In this capacity, she oversaw sixteen departments housing approximately 300 employees devoted to processing over 100,000 criminal and civil cases annually in New Mexico's most populous and diverse urban area.

Nakamura was subsequently appointed to a higher court by New Mexico's Governor. Upon Nakamura's departure, and having now served Courts for over twenty-five years, Williamson began work with the New Mexico Public Education Department to employ skills gained as part of her doctoral work in education policy at the University of Kentucky. Initially appointed to manage the Licensure Bureau, within four months Williamson was promoted to Director of NMTEACH. NMTEACH is a statewide program focused on providing equity in education for the state's diverse student population through assessment of New Mexico's twenty-four thousand teachers. She was also tasked with overseeing the Department's Title II formula grant totaling approximately fifteen-million dollars annually for purposes of instituting professional development for teachers, as well as working with the Council of Chief State School Officers on the nationally renowned Teacher of the Year Program.

Two years into her employment with the Public Education Department, Williamson received an inquiry from the Kentucky Labor Cabinet. Though hesitant to leave her beloved post and dynamic staff with the New Mexico Education Department, in August of 2016, Williamson moved back to her home state of Kentucky. In two weeks' time she researched and wrote outside of her known subject areas, and won a competitive grant from the U.S. Department of Labor. The proposal funded expansion of the Commonwealth's registered apprentice program for businesses and industries located in the state. Today, and with additional federal funding, she oversees what promises to be a very successful multi-year grant endeavor, ensuring a skilled workforce is trained and available to meet the rapidly expanding needs in Kentucky.

Beyond her daily work with state governments, her leadership role in law-related education for k-12 youth and young adults has taken her to several foreign destinations to serve as a consultant. During the Bosnian conflict, Williamson and fifteen colleagues journeyed to Bosnia-Herzegovina to work with educators who had kept schools open during the war in order to provide children a sense of normalcy. As one can imagine of that conflict, the experience left a lasting impression, connections with colleagues for life, and an even deeper commitment to peace negotiations. This work also took her to Germany, Northern Ireland, and Poland where she was asked to present her work in law-related education in the United States, specifically as related to youth in alternative correctional settings, and the pioneering and nationally acclaimed Kentucky Teen Court program.

An author of numerous publications, Williamson earned her Ph.D. in sociology and education policy from the University of Kentucky.

Reflecting back on her career, she relishes intense time spent with talented, diverse leaders and staff, problem-solving complex issues and projects, ones with widespread social impact, tight deadlines and large deliverables. The synergistic energy that releases when everyone is committed to accomplishing the same end, particularly when it is for the good of the larger society, is simply unsurpassed from both a leadership and humanistic standpoint. Looking very much forward, she hopes for more of the same type of challenging and dynamic trajectory in her career.

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