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Reauthorization of Apprenticeship Legislation

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Chairwoman Davis, Ranking Member Smucker and distinguished Members, I am the Talent Director for IBM Systems, one of several IBM business units that have successfully used IBM's registered apprenticeship program.

Apprenticeships provide an additional pathway to compelling careers at IBM and other employers. Since the start of our apprenticeship program in 2017, IBM has hired over 500 apprentices across roles ranging from mainframe computer administration to cybersecurity to data science. We have hired apprentices in 15 states, including California, Virginia, North Carolina, Texas, Connecticut, and Massachusetts. Candidates for apprenticeships are drawn from a mix of backgrounds often passed over by the United States' higher-education system.

IBM has worked to modernize our apprenticeship programs focusing on competency-based education and skills and scaling it across our industry. We have registered more than 25 new roles in information technology with the US Department of Labor and collaborated with other employers and associations to enable their efforts to bring more people into the workforce through this educational pathway.

For "New Collar" professionals, meaning those that don't necessarily have a bachelor's degree, and even for those with bachelor's degrees, pursuing and completing an apprenticeship has proven to be a valuable and accessible entry point into today's most in-demand tech roles.

As Clayton Slaughter, an IBM mainframe apprentice from Texas says: "When I was interviewing with my manager, she was happy to hear I had prior experience and technical aptitude, but what got me the job was my desire to be there. I asked, 'What can I do to start learning? How can I improve my odds? I would encourage any company, not just tech companies, to open apprenticeships to allow people the opportunity to shine because I know that there are many others who, like me, have the aptitude and skills but not the access to higher education required at many companies."

<u>Challenges US Companies Face in Filling Jobs with Skilled Employees</u>

IBM is a leader in apprenticeships and believes that apprentices make great employees. And it is important to create additional education pathways to careers.

Unfortunately, the U.S. education system is not producing candidates with relevant technical or soft skills for jobs in the information technology sector except from a narrow swath of students. The pathways through education include many barriers and often leave students with debt but no degree.

Inclusion: Around two-thirds of the U.S. working age population does not have a bachelor's degree.[1] The distribution of bachelor's degrees is low and uneven across income[2], race, age, and gender[3] (in addition to geography). As a result, higher education graduates are from a much narrower band of students than the US population. Additional educational pathways such as apprenticeships can provide career opportunities to those that haven't graduated with a bachelor's degree – and those additional students that are ending their education early, with debt but no degree, have degrees in areas that don't match up to high-demand jobs, or have the aptitude and drive but do not want to pursue higher education.

Alignment: Often, higher education institutions simply do not offer majors, minors, degrees, or programs in the most demanded skills. For example, a prominent California university offers Computer Science and Computer Engineering majors, but only a single course in cybersecurity – the upper division "CS 574 Computer Security."[4]

Community colleges are offering more and more information technology programs making them an important source of talent. San Diego City College is a good example with courses and certifications in web services, cybersecurity, and programming.[5] However, fewer than 30 percent of the roughly 1,100 public and independent community colleges across the United States offer a cybersecurity degree, certificate or course.[6]

Attainment: The Higher Education Act does not permit financing for programs of less than 600 hours – exactly the type of education pathway that is conducive to information technology certifications. Even when a higher education institution offers information technology courses, the bumpy and obstacle-filled pathway of higher education interferes with progress to graduation. End-to-end, only 13% of the 852,439 students who enrolled in community college in 2010 persisted to a bachelor's degree by 2016.[7]

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[1] https://www.census.gov/data/tables/2018/demo/education-attainment/cps-detailed-tables.html

[2] http://www.equality-of-opportunity.org/papers/coll_mrc_paper.pdf

[3] https://nscresearchcenter.org/wp-content/uploads/Completions_Report_2019.pdf

[4] https://curriculum.sdsu.edu/curriculum-services/general-catalog/19_20_gc/057-Computer-Science.pdf Page 206

[5] http://www.sdccd.edu/docs/StudentServices/catalogs/2019-2020/City_2019-2020_catalog.pdf Page 199

[6] "2016 Fact Sheet." American Association of Community Colleges. http://www.aacc.nche.edu/AboutCC/Documents/AACCFactSheetsR2.pdf; IBM Institute for Business Value interview with Casey O'Brien, Executive Director & Principal Investigator, National CyberWatch Center. February 21, 2017.

[7] https://nscresearchcenter.org/wp-content/uploads/SignatureReport13_corrected.pdf

One of the biggest obstacles in the education pathway to careers is the transfer of credits. The GAO has found that "students who transferred from 2004 to 2009 lost, on average, an estimated 43 percent of their credits."[8]

The obstacle to transfer of credits is particularly severe for information technology and other technical and career-oriented courses. For example, students taking courses in C++, or Java at San Diego City College can transfer those credits to San Diego State, but there is no articulation agreement for any of the SDCC courses in cybersecurity, web services, Desktop support, or Game Programming.[9]

Apprenticeships and the IBM New Collar Approach

IBM's New Collar approach focuses on skills first — not degrees earned - and emphasizes work-based learning and core skills, like teaming and adaptability. It is a pathway to finding and attracting nontraditional candidates with diverse backgrounds and skill sets.

IBM seeks New Collar employees with learning agility, skills, and experience who will seek continuous lifelong learning and professional growth.

To expand our number of new collar employees, IBM is experimenting with a multitude of approaches to educate and develop the next generation of technology professionals. The primary approaches are:

- Apprenticeships
- Placing a higher emphasis on "Skills First", rather than degrees, in our hiring and careers mission
- Pathways in Technology Early College High School (P-TECH) – a 9-14 school model that aligns education with job skills.

IBM is working on these priorities with the Business Roundtable, an association of chief executive officers of America's leading companies working to promote a thriving U.S. economy and expanded opportunity for all Americans through sound public policy. Our CEO, Ginni Rometty is currently the Chair of the BRT Workforce Committee and many member companies have similar workforce concerns.

Apprenticeship: IBM launched our Department of Labor Registered Apprenticeship Program in October 2017. It's a program for the 21st century, focused on building skills in cybersecurity, data science, software development and more. This 12-24 month program pairs apprentices with an IBM mentor to work on actual IBM projects, along with traditional classroom learning, in technology's fastest-growing fields.

The apprenticeship program includes:

- defined competencies, milestones, testing, and completion standards
- recruitment that seeks learning agility, and credits experience and soft skills

[8] https://www.gao.gov/products/GAO-17-574
[9] https://assist.org/transfer/report/23102239

- real time review and ongoing improvement
- blended learning including classroom and on-line training
- access to IBM's learning platform as well as external education resources
- credit for prior knowledge and experience
- mentorship
- attainment of industry-recognized skills standards

Having a standardized apprenticeship model registered with the Department of Labor allows us to share our apprenticeship model more easily with organizations, companies and even state governments, such as California. The process prompts employers to think about creating a quality program with supports, like mentoring and additional training.

A common challenge to employers in today's workforce is retention. Individuals participating in the apprenticeship programs develop a strong loyalty and have a high retention rate in their technical field.

Our apprenticeship program has improved a lot as we have learned along the way. We have been able to learn from apprentices whose first-hand experience has allowed us to make a better program for each cohort. Clayton Slaughter said, "Because we were so early in the program, many of the criteria was outdated or in some cases just incorrect. We provided that real-time feedback to our managers. As we've observed and assisted the second wave of apprentices in our group, we've gotten to see that our feedback was acted on which was very reassuring." Our apprenticeship framework provides enough flexibility for those adopting our model to continuously improve their apprenticeships and share those improvements with others.

In January 2019, IBM and the Consumer Technology Association formed an Apprenticeship Coalition to help drive industry awareness and adoption. Through this coalition, we at IBM share our best practices, toolkits and competency frameworks to help more IT companies scale our apprenticeship model and roles.

In November, the California State Government and IBM launched the state's first of its kind collaboration to create technology apprenticeships.[10] This program will adopt IBM's proven apprenticeship model to address a statewide skills shortage in three critical fields: Mainframe System Administration, Software Engineering, and Application Development. According to SEIU's Local 1000 Research Department, there is an 18.6% vacancy rate in state civil service IT positions, and not enough applicants with the right mix of skills to fill these jobs.

By using IBM's apprenticeship program as a model, the California Division of Apprenticeship Standards can fast-track new apprenticeship roles and directly address the skills gap by expanding access to new learning opportunities as well as create growth opportunities for their incumbent workforce. Apprentices in the program will participate in on-the-job training, mentoring, and classes – all while earning decent wages in an "earn while you learn" model that can provide valuable skills without the need to take on new student debt.

Skills First Hiring: Faced with an extreme skills shortage and rapid changes in the workforce, companies are increasingly finding that a "skills first" hiring strategy, rather than job criteria

[10] https://www.prnewswire.com/news-releases/california-state-government-and-ibm-launch-the-states-first-of-its-kind-collaboration-to-create-technology-apprenticeships-300958296.html

based on academic degree requirements, allows the development of a more qualified and diverse workforce. Companies are finding that recruitment mandates, such as bachelor's degrees, have excluded workers with valuable skills and experiences who would make good, employees with life-long commitments to learning. Skills First hiring also allows companies to develop a workforce with learning agility, and therefore more responsive to the changing skills of the digital economy.

This is not to say that degrees ought to be deleted from all job postings; rather, companies are increasingly finding that their employees' success depends more on their ability to continue to learn and adapt than on what they had learned at the time of hire. Lifelong learning, upskilling and reskilling are all essential elements for successful talent management strategy given the changing nature of work.

P-TECH: For younger workers, there are pathways into IT jobs as early as high school that provide them with the right mix of skills for apprenticeships or other jobs. Through P-TECH, public high school students can earn both a high school diploma and an industry-recognized two-year postsecondary degree at no cost to them or their families, while working with industry partners like IBM on skills mapping, mentorship, workplace experience and internships.

The P-TECH model of schools has four key elements:

- Alignment of the Program of Study for grades 9-14 with the skills needed by an employer
- Mentors for all students from the employer
- Internships for students from the employer
- A commitment that graduating students will be first in line for a job with the employer.

Today, over 220 P-TECH schools, or Pathways in Technology Early College High Schools, are educating students in 24 countries with the participation of over 600 companies.

Together, apprenticeships, skills first, and P-TECH provide three additional education pathways into careers at IBM. All are creating job opportunities for students and workers, and allowing IBM to tap into sources of skills and experience beyond today's higher education graduates.

What Should the U.S. Government do to expand apprenticeships as a pathway to careers?

For apprenticeships to gain wider adoption, we need to eliminate obstacles for both employers and individuals and work to create more inclusion into these proven training models.
The biggest barriers that we see are complexity and funding.

Complexity: Implementation complexity is a great concern and barrier for many companies wanting to leverage apprenticeship programs.

1. Modernization – The US Department of Labor's expertise is not shared by states. There is a general lack of understanding of competency-based apprenticeships by state agencies. This leads to confusing and inconsistent implementation practices. Additionally, the process for approvals of standard can become a long process taking upwards of 90 days.

2. Reciprocity – the lack of reciprocity undercuts funding. It also creates implementation complexity across state borders.
3. Reporting needs can become overwhelming and are often not relevant to program requirements.
4. Parallel structures – For larger companies seeking to be involved with apprenticeship, the dual model (some federal, some state) provides unneeded complexity around where and how to register a program, and provides often duplicative work if registration is needed in multiple places.
5. Employer Consortiums – Many of the skills that IBM needs also extend to our broader ecosystem of clients and partners. The current structure and processes make it difficult to create programs that can easily scale to a broader community of employers. The administrative burden on each employer is a barrier.

Funding: Apprenticeships are an important additional education pathway to careers, and IBM supports providing funding for apprenticeship. Annually, the Unites States spends more than $1.1 trillion on formal and informal post-secondary workforce education and training.[11] Of that total $1.1 trillion, the Georgetown Center on Employment estimated that $47 billion was spent on apprenticeships, certifications, and other workforce training.[12] The US Department of Labor's appropriated funding level for apprenticeship programs in 2020 was $175 million. Federal funding for apprenticeship is miniscule for such a successful pathway to careers.

1. Pre-apprenticeship and length of journey – Funding needs to be extended for pre-apprenticeship programs, and apprenticeships that can carry students through longer skilling journeys. We seek to meet people where they are in their learning journey…whether they are students, career changers, veterans, displaced workers or just seeking to gain technical proficiency. Entry points into these programs vary. Pre-apprenticeship programs and reforms to the education system can extend apprenticeship programs.
2. Apprenticeship Funding – Funding access is confusing and difficult to secure often preventing employers from opting-in. Overall funding opportunities are small and often not the needed incentive to help support companies, educators, and intermediaries in launching quality programs.
3. Quality technical support – We applaud the efforts of our workforce intermediaries, but often these organizations have no implementation experience making it confusing and difficult to give consistent guidance. Improved funding for technical support will enable better service levels of support to be provided by workforce intermediaries.

Pathways from education to apprenticeships (and throughout careers): IBM urges the House to move remove obstacles in the Higher Education Act that could help prepare students for apprenticeship programs.

1. Allow students to use their Pell Grants for shorter education programs that lead to certifications. Under existing law, students who need short-term programs of 150 to 600 hours length in order to get certifications are required to sign up for longer education programs or forgo federal financial assistance.

[11] https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/2015/02/Trillion-Dollar-Training-System-.pdf

[12] https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/2015/02/Trillion-Dollar-Training-System-.pdf

2. Remove restrictions on student use of funds for off-campus work experiences like internships at companies. These funds should not be restricted to supporting jobs in campus cafeterias and libraries. The US Department of Education recently removed obstacles placed by the federal government between students and career oriented work study on 190 college campuses. IBM urges Congress to enact legislation to remove the obstacles for all students seeking to use their Federal Work Study as an opportunity to advance toward a job.

Extend P-TECH Model to pre-apprenticeship: Pre-apprenticeship can close the gap between a student's skills and those needed for an apprenticeship. The P-TECH model is based on a collaboration between employers and educators to improve alignment of the existing education system with needed job skills. Developing programs of study and educational materials is the responsibility of our nation's educators, but P-TECH employers play a vital role by identifying and sharing with educators the necessary skills "to be first in line for a job". Defining skills , providing mentors, internships, and committing that graduates will be "first in line for a job" are all components in the P-TECH model that can be implemented into pre-apprenticeships.

Conclusion:

With the approaches above, IBM believes that apprenticeship opportunities can and should be expanded. There are many innovative approaches to improving apprenticeships happening across the country, and we ought to scale this important education and skills pathway. If done well, we can close the skill gaps that exist in many industries and more Americans can have access to some of the most in-demand tech jobs and roles.

Thank you, Members of the Committee, for the opportunity to present IBM's approach to improving apprenticeship and your consideration of this testimony. I look forward to your questions and working with the Committee to modernize the Apprenticeship program.