

THE GEORGE W. BUSH INSTITUTE-SMU ECONOMIC GROWTH INITIATIVE
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BOLSTERING NORTH AMERICA'S COMPETITIVENESS

VIA A COORDINATED APPROACH TO WORKFORCE DEVELOPMENT

A STUDY

MATTHEW ROONEY

SENIOR ADVISOR, GEORGE W. BUSH INSTITUTE-SMU ECONOMIC GROWTH INITIATIVE

TIFFANY MELVIN

PRESIDENT, NORTH AMERICAN STRATEGY FOR COMPETITIVENESS (NASCO)

STEPHANY LAVERTY

POLICY ANALYST, CANADA WEST FOUNDATION

CYLYNN BRASWELL

SENIOR ADVISOR, ANALYTICS, FRONTLINE EDUCATION

LUIS HERNANDEZ

PRESIDENT, EL CONSEJO NACIONAL DE LA INDUSTRIA MAQUILADORA Y MANUFACTURERA DE EXPORTACIÓN (INDEX)

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GEORGE W. BUSH INSTITUTE-SMU ECONOMIC GROWTH INITIATIVE

The Bush Institute-SMU Economic Growth Initiative combines the public policy expertise of the George W. Bush Institute and the academic expertise of SMU. The joint initiative draws from economic policy-making experience at the highest levels and from cutting edge academic research to identify ideas for promoting innovation, entrepreneurship, and faster, more inclusive growth through global competitiveness and sound immigration policy.

NORTH AMERICA WORKFORCE INITIATIVE

The North America Workforce Initiative, a joint undertaking co-chaired by the George W. Bush Institute-SMU Economic Growth Initiative and North American Strategy for Competitiveness (NASCO), began in 2016 to develop and test practical approaches to workforce development across the U.S., Canada, and Mexico and issue recommendations to strengthen the region's global competitiveness.

INTRODUCTION

Canada, Mexico, and the United States have long partnered to compete in the global marketplace. However, each country has a different system for recognizing skilled trades and for funding, administering, and certifying training. This ingrained inefficiency has reduced our global competitiveness even as companies operate across the three countries. A shifting global economy has made the issue increasingly urgent as countries look to re-shore supply chains and, as a result, need to ensure that their workforces have the necessary skills.

Each of the three countries could be strengthened through a coordinated approach. National apprenticeship and skilled trade systems are intended to provide individuals with jobs and industry with skilled talent now and in the future. However, recent reports of labor market pressures have refocused attention on the ability of these systems to meet this goal, particularly in the manufacturing and logistics sectors. Labor shortages in Canada and the United States and job shortages in Mexico have governments looking to increase representation of “opportunity populations,” those who are traditionally underrepresented in the skilled trade and apprenticeship systems. Both the advanced manufacturing sector and the transportation, distribution, and logistics (TDL) sector face complicated challenges in recruiting and retaining world-class talent. The difficulty in attracting talent in emerging fields with technological advancements, coupled with an aging workforce, has created a labor shortage within a variety of industries. Both advanced manufacturing and TDL have felt the strain of the growing scarcity of skilled workers. Nearly 2 million manufacturing jobs will be unfilled by 2030 in the United States alone, estimates show (Association for Career & Technical Education, 2021).

A North American approach that aims to create a more inclusive, skilled, and mobile workforce throughout the continent is needed. Better collaboration between and alignment of workforce development systems across North America will result in higher employment rates for opportunity populations, efficient and successful re-skilling, a more ready workforce, lower training costs, and a more mobile labor force. This report provides an overview of skilled trade and apprenticeship systems in the three countries, with a focus on the manufacturing and logistics sectors. The report also identifies inefficiencies in the systems and calls out opportunities to expand representation in the skilled trades. An [accompanying report provides specific recommendations](#) for North America to adopt a more unified approach in workforce development.

CANADA

Expanding workforce opportunities in the manufacturing and logistics sectors

Canada’s manufacturing industry produces a wide range of goods including chemicals, food and beverages, machinery, and electronics (Statistics Canada, 2022). In 2022, 52,000 businesses in the sector employed 1.8 million people, and total domestic and international sales reached \$622.8 billion (2012 constant dollars; Statistics Canada, 2023c). Manufacturing led Canada’s goods-producing industries and was second in total contribution to Canada’s GDP, behind only real estate, rental and leasing (Statistics Canada 2023a). Just under 70% of Canada’s total merchandise exports are from the manufacturing industry.

Complementing the manufacturing sector, the transportation and warehousing industry uses road, rail, water, air, and pipelines to store goods and move goods and people (Innovation, Science, and Economic Development Canada, 2023). In January 2023, 32 billion metric tons of freight, mostly wheat, iron, coal, canola, and other cereal grains, traveled Canadian railways (Statistics Canada, 2023b). While the measured GDP contribution of transportation and warehousing is small compared to some other industries, the industry is essential for goods produced by other industries to reach the market (Transport Canada, 2021).

Eighty percent of Canadian manufacturers are “currently facing labor and skills shortages,” according to an October 2022 survey by the Canadian Manufacturers and Exporters (CME). This figure is up sharply from 60% in 2020 and 39% in 2016 (CME, 2022, p. 4). For two-thirds of those surveyed, the most urgent shortages were in the skilled trades (CME, 2022, p. 4). To address labor shortages, 41% said that they “increased efforts to hire underrepresented persons” such as visible minorities, women, and Indigenous people (CME, 2022, p. 13). The report also recommends immigration as part of the solution (CME, 2022, p. 13). Despite these efforts, underrepresented populations continue to face barriers to employment. The federal government has funded specific programs to address those barriers and attract underrepresented groups to the workforce, including the skilled trades.

Meanwhile, Canada recently announced changes to the immigration system and plans to boost the number of employment-based immigrants to 500,000 a year by 2025. In 2022, the country broke its previous immigration record with 430,000 immigrants arriving (D’Andrea, 2023). In addition, the government amended the Temporary Foreign Worker (TFW) program to raise certain sector caps on the percentage of an employer’s workforce that can be made up of TFWs. They also extended the duration of an employer’s Labour Market Assessment (the right to employ a TFW) to 18 months (CME, 2022). A pilot program will start in 2023 to permit spouses and working-age children to also become TFWs when a spouse or parent is accepted into the program, unless the primary worker is admitted under the agricultural stream or Seasonal Agricultural Worker Program (Government of Canada, 2023). While these amendments are a positive step, the government could also consider expanding the TFW program to include more manufacturing workers. In conjunction, the Pan-Canadian Framework for the Assessment and Recognition of Foreign Qualifications is a federally funded initiative to support the recognition of foreign credentials (Employment and Social Development Canada, 2022). Provincial bodies and governments are also removing barriers for credential recognition in high-demand occupations.

The mobility of workers will also play a key role in bolstering Canada’s labor market. The Alberta government passed the Labour Mobility Act in 2021 to allow interprovincial movement of certain professions, including those in skilled trades that are key to manufacturing and logistics, and reduce the time it takes for associations to assess credentials (Government of Alberta, 2021). Ontario removed Canadian experience requirements for permanent residents in specific regulated professions, including some skilled trades, in 2021 (Weller et al., 2021).

There are also programs to increase the participation of underrepresented communities in the skilled trades (Powell & Richardson, 2021). The federal government provided \$33 million for the Skilled Trades Awareness and Readiness (STAR) program in 2022, with funds to be dispersed to organizations working to increase inclusion and representation in the skilled trades (Link2Build, 2022). There are also many examples of provincial governments, community organizations, and industry associations engaging in similar work.

Training and credentialing the workforce

Under the Canadian constitution, each province and territory is responsible for education, including technical and postsecondary. Most technical schools (many of which are union based) and colleges, which provide the classroom portion of skilled trades and apprenticeship education, receive funding from provincial/territorial governments in addition to student tuition and donations. Training and credentialing requirements may differ depending on the “industrial, economic, and geographic realities of a province or territory” (Canadian Apprenticeship Forum, n.d.) Most jurisdictions also identify designated or compulsory trades, which require either enrollment in an apprenticeship program or receipt of a journeyperson certificate to work in that trade.

The localized nature of education creates problems for worker mobility. A designated trade in one province may not be a designated trade in another (Apprenticeship and Industry Training, n.d.). Provinces/territories may not recognize training that is credentialed in another jurisdiction, whether from another province or country, and individuals may have to take supplemental training or exams to work in their occupation. Fortunately, those who receive a journeyperson designation can take an exam to receive the Red Seal designation, which allows them to work in other parts of Canada without taking additional training or testing (Newfoundland Labrador, 2021). The Canadian Council of Directors of Apprenticeship (CCDA), which is composed of members appointed by each province and territory, oversees the program (Red Seal Program, 2018). The CCDA develops Red Seal standards and has been working with provinces to align and harmonize these standards with provincial apprenticeship standards (Red Seal Program, 2018; Red Seal Program, 2022). In response to labor shortages, some governments are looking to ease interprovincial and international barriers to the movement of credentialed skilled workers (Chiang, 2022; Joannou, 2021; Wilson, 2022). A comprehensive solution to improve worker mobility will include cooperation and alignment between CCDA and other North American entities using the framework of USMCA.

UNITED STATES

Expanding opportunity through career and technical education (CTE)

Three-quarters of U.S. manufacturers identified “attracting and retaining a quality workforce as a primary business challenge” in a 2023 survey from the National Association of Manufacturers. A 2021 survey by Angi, Inc., indicated that 77% of those who worked within the skilled trades identified labor shortages as a problem.

Fixing these problems requires a flexible workforce that can meet the needs of industry (Zaber et al., 2019). Workforce exploration through career pathways, adult and technical education, work-based learning (including apprenticeship models), and industry credentialing is a crucial way to build this flexible workforce. Since the Strengthening Career and Technical Education Act was signed in 2018, high school and postsecondary training programs intentionally sought out diverse candidates to fill jobs in industries with shortages.

Career and technical education (CTE) in the United States is rooted in the federal Perkins Act of 1990. The law defined vocational training, now CTE, as education that prepares individuals for employment

outside traditional university degree programs (Levesque et al., 1995). The Perkins Act initially rolled out CTE in secondary, postsecondary, and adult education systems. Then, university-level CTE was included in 2006 (Forrest Cataldi, 2011).

Many of today's CTE initiatives attempt to offer access to middle-skill jobs in high-wage, high-demand fields. The most promising programs provide the following: 1) a clearly articulated pathway from high school through postsecondary education, 2) stackable credentials that pave the way for career advancement, and 3) quality work-based learning experiences (Rosen & Molina, 2019).

American CTE programs strive to provide students with the academic and technical skills, knowledge, and training necessary to find career success. CTE prepares learners by providing context to academic content through hands-on opportunities. CTE programs include aligned course offerings, career-focused experiences, work-based learning opportunities, and school-employer partnerships (Ivy Tech Community College, n.d.). Each of these components is designed to engage students in skill building, develop successful transitions to postsecondary opportunities, grant industry-based credentials, and/or help students step right into a career.

Competition for jobs and economic growth in the United States has boosted CTE enrollment. It expanded 170% in Texas between 1996 and 2006, illustrating the increased importance of CTE programs as a component of secondary education (Dallas Morning News, 2007). CTE programs focus on sustainable opportunities for work beyond high school and have become positive connectors between students, schools, and the world of work (Rosen, 2017).

Despite CTE programs' successes, they remain overlooked and underutilized by many talented people. Attracting more opportunity populations to CTE will require changing perceptions, including a common misconception that a CTE program won't lead to as much of a "meaningful and well-paid career as a four-year college degree" (Colorado Succeeds, 2016).

Marketing the benefits of CTE programs to young people is increasingly important. Along with earning high wages, skilled workers stand to benefit from rewarding experiences with upward mobility and career-track potential. The myth that singular training creates an immobile worker needs to be removed from the North American mindset. The enhanced marketing effort to attract people to CTE programs should be multifaceted with collaboration from the education sector, business, industry, and the three federal governments.

The model of U.S. apprenticeship programs

In the United States, registered apprenticeship programs fall under CTE at the postsecondary level. Credentials can be validated by either the U.S. Department of Labor or a state agency, depending on whether a federal or state body oversees the apprenticeship (ApprenticeshipUSA, n.d.-a). High schoolers 16 years of age and over can also enroll in pre-apprenticeship or registered apprenticeship programs (ApprenticeshipUSA, 2022). Credential recognition between jurisdictions can be challenging, as Federal, state and other bodies may have different requirements (Rabben, 2013). Nonetheless, registered apprenticeship programs are considered one of the most effective models for recruiting, training, and retaining a skilled workforce (ApprenticeshipUSA, n.d.-b).

In addition, the Department of Labor provides funding for apprenticeships that focus on a variety of opportunity populations, including justice-involved youth, young adults, and formerly incarcerated adults. Specific programs within the apprenticeships focus on “new to workforce” individuals. The Registered Apprenticeship program has also created pathways for U.S. servicemembers or veterans looking for new career opportunities (ApprenticeshipUSA, n.d.c). These apprenticeships are designed to develop skills while assisting individuals in finding relevant employment (ApprenticeshipUSA, n.d). This dynamic model of workforce development is ideal for employers struggling to find talent.

Advanced manufacturing apprenticeship programs currently offer courses in “welding, woodworking, metal and plastics processing and production; computer aided design and computer integrated manufacturing; electro-mechanical systems; and more, all integrated with rigorous academics” (Association for Career & Technical Education, 2021). Many of these programs across the country focus on opportunity populations. One example is Women in Welding, located in Mason City, Iowa. It offers a 60-hour production welding course for entry-level trainees with the company Gas Metal Arc Welding (IMT, 2019). Programs such as these are addressing the gender imbalance and talent shortage that is pervasive in the manufacturing industries (Banks, 2022).

Furthermore, there are a variety of programs throughout the United States that connect community and technical colleges with industry partners to prepare highly skilled technicians. Within the world of manufacturing, the Advanced Manufacturing Technical Education Collaborative (AMTEC) offers a competency-based curriculum aligned with an industry-led maintenance certification assessment available through the National Occupational Competency Testing Institute (NOCTI). This program is producing highly skilled graduates in Kentucky to meet the demands of the advanced manufacturing sector (Association for Career & Technical Education, 2021).

Apprenticeship opportunities are available in many other sectors beyond manufacturing. Nationally authorized programs exist in agriculture, construction, cybersecurity, education, energy, financial services, health care, hospitality, information technology, telecommunications, transportation, and logistics (ApprenticeshipUSA, n.d.-a). The transportation, distribution, and logistics (TDL) sector, in particular, has recently expanded apprenticeships in response to critical talent pipeline shortages. There were 8,651 apprenticeships in the TDL industry in 2021, an 18% increase over the past eight years (ApprenticeshipUSA, n.d.-e).

The American Trucking Association (ATA) estimates that the U.S. trucking industry currently needs an additional 80,000 drivers (Samsara, 2022). In response, the 2021 U.S. Infrastructure Investment and Jobs Act provided funding for the Federal Motor Carrier Safety Administration (FMCSA) to establish a program that makes it possible for commercial driver’s license (CDL) holders ages 18 to 20 to operate interstate routes after completing a rigorous apprenticeship program (Public Law 117-58, 2021). Previously, those under 21 could only drive within state lines. There are currently 14 trucking companies or businesses engaged in the new initiative (FMSCA, 2023). This two-part probationary program provides 400 hours of on-the-job training under the supervision of a commercial vehicle driver with five or more years of experience (Samsara, 2022). Targeted government funding for high-impact apprenticeship programs such as this will go a long way toward creating the responsive workforce that the United States and North America need.

These apprenticeship models are examples of how the public, private, and education sectors are collaborating to develop the U.S. workforce of tomorrow. Expanding such programs to incorporate training and credentialing across North America could provide an even better solution to the labor shortages facing the region.

MEXICO

Regional, gender, and age disparities in the manufacturing and logistics workforces

Mexico's workforce comprised close to 60 million people ages 15 and up by the end of November 2022, with 16.5% working in manufacturing (Instituto Nacional de Estadística y Geografía, 2022). Notably, 55.2% of Mexico's workforce, or 32 million people, were engaged in informal work (working for cash, or off the books, many times because the employer is not a registered business or is a small street vendor), an increase of 1 million people from the year earlier. The informal economy refers to the "market-based and legal production of goods and services that is hidden from public authorities for monetary, regulatory, or institutional reasons" (Elgin et al., 2021). Women are more likely than men to be engaged in informal work (Elgin et al., 2021).

More than 6 million manufacturing jobs are in the formal economy, and about 3.5 million are in the informal economy (Data México, n.d.-a). Women represented 40% of the manufacturing workforce at the end of 2022 (Data México, n.d.-a). Most manufacturing workers are industrial machine operators, drivers, and assemblers or craft workers, such as tortilla and bread makers or cabinetmakers (Data México, n.d.-a). Jobs tend to be clustered near the U.S. border and central regions as manufacturers choose to locate close to international markets and domestic customers (Entrada Group, n.d.).

More than 2.5 million people worked in transportation and warehousing at the end of 2022, and just 10.7% of them were women (Data México, n.d.-b). Only 47% of the total jobs were in the formal sector, with the rest in the informal economy (Data México, n.d.-b). More than two-thirds of the jobs in the sector are held by drivers of trucks, buses, and motorcycles and operators of machinery (Data México, n.d.-b). Business operators in specific regions are struggling to find skilled workers, since logistics workers aren't evenly distributed throughout the country (Boling, 2022).

While women make up just over half of those who graduate from upper secondary education, they tend to be underrepresented in the workforce (Organization for Economic Cooperation and Development, 2022). This is due to a number of factors, including household expectations, lack of social support, and low pay (Salazar, 2021). The Organization for Economic Cooperation and Development (OECD) has identified increasing the numbers of women in science, technology, engineering, and mathematics (STEM) fields as "crucial to closing gender gaps in the labor market and promoting more inclusive growth" (Gurría, 2020). Indigenous communities, particularly Indigenous women, also face social, economic, and education barriers to the workforce (International Workgroup for Indigenous Affairs, 2022). The Consejo Nacional de Fomento Educativo (CONAFE) works to increase inclusion of underrepresented populations, such as rural and Indigenous people and women, in education. CONAFE and the National College of Technical Professional Education (CONALEP) partnered in 2020 to increase access of these groups to the Mexican Model of Dual Apprenticeships (MMFD) and build associated teacher credentials (Gobierno de Mexico, 2020).

Mexico as a manufacturing hub and the key role of workforce development

Mexico became a manufacturing hub for the world, particularly the United States, after the North American Free Trade Agreement (NAFTA) was signed in 1994. Taking advantage of labor arbitration, U.S. companies were able to position themselves as top-choice employers for Mexican professionals.

Looking to the future, demographics suggest that the Mexican manufacturing sector will continue to attract investment from North America and the world. Ninety-two percent of Mexico's population is under the age of 65, which means that the country offers a younger workforce than manufacturing competitors such as Vietnam and China (United Nations Population Division, n.d.). Proximity to the U.S. and Canadian markets gives Mexico another significant advantage over Asian competitors.

Since 1994, Mexico has developed specialized capabilities to produce medical devices, electronics, and automobiles. During the past 10 years, these capabilities have been developed using the VECTOR approach, which stands for Vision and Leadership, Employment, Culture and Mindset, Technology, Organization and Routines.

More than 6,000 international companies such as Samsung, Foxconn, Lear, Caterpillar, Ford, General Motors, Medtronic, and Whirlpool have located operations in Mexico since NAFTA began.

Despite Mexico's great potential, many of its workers do not possess the skills needed to perform higher-level jobs. In large part, this problem stems from a deficient educational system; 41% of Mexican schools lack basic infrastructure to provide education, such as sewage systems, and the Mexican educational system is characterized by its high degree of exclusion (Associated Press, 2014). For every 10 children who enter primary school, only five finish high school (ICFDN, 2022). Put plainly, not enough people are in school, not enough people finish school, and not enough people learn.

Evaluations of educational quality in Mexico show a wide deficiency at the basic levels. The Programme for International Student Assessment (PISA) created by Andreas Schleicher indicates that Mexico does a poor job of customizing education to the different strengths and weaknesses of its students. As of now, the federal government has closed the operation of the National Institute for Educational Evaluation and there is no record of the competencies that are achieved in the educational system.

CONCLUSION

There is a clear need for aligned industry credentials across North America. Although the fundamental skills needed are congruent across the three countries, the training and certification processes in place and the variable geometry of federalism at work in the three countries pose a challenge. Getting from the status quo to anything approaching alignment of credentials will be a complex and time-consuming project that will require a strong partnership between government at all levels, private industry, and labor. In a [subsequent paper](#), we will offer the outlines of a roadmap and initial priorities for moving in that direction.

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