COUNCIL OF THE GREAT LAKES REGION
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Policy Insights

Great Lakes. Great Minds.

Setting the stage for higher education, business, and government collaboration in the Great Lakes to drive talent development, innovation & entrepreneurship

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About the Council of the Great Lakes Region (CGLR)

CGLR is a binational network of organizations comprised of: (1) Council of the Great Lakes Region, an Ohio nonprofit corporation exempt from federal income tax under section 501(a) of the Internal Revenue Code of 1986 (as amended, the "Code") and classified as a trade association described in Code section 501(c)(6) ("CGLR USA"); (2) CGLR Foundation, an Ohio nonprofit corporation exempt from federal income tax under section 501(a) of the Code and classified as a public charity described in Code section 501(c)(3) ("CGLR Foundation"); and Council of the Great Lakes Region, a Canadian nonprofit corporation ("CGLR Canada").

Together, the CGLR focuses on deepening the United States-Canada relationship in the Great Lakes economic region, and creating stronger, more dynamic cross-border collaborations in harnessing the region's economic strengths and assets, improving the well-being and prosperity of the region's citizens, and protecting the Great Lakes watershed for future generations. It achieves this mandate by connecting regional leaders through the annual Great Lakes Economic Forum and sector dialogues, exploring key trends shaping the region and proposing solutions and strategies that move the region forward through public policy research, and acting as a strong voice for the region's varied interests.

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Executive Summary

The United States and Canada share a relationship that is unmatched anywhere else. Together, both countries have built one of the longest standing, deepest, and most successful economic partnerships in the world. Because of a common history, Indigenous and non-Indigenous cultures and families extend seamlessly across the narrow border that divides the two nations. Additionally, both countries are stewards of majestic and critically important transboundary natural spaces, from the Great Lakes and the hundreds of other lakes and rivers that either form or flow across the border, to the prairie lands and the Rocky Mountains.

However, as the United States and Canada look to the future and consider strategies for ensuring their individual and mutual success in an ever expanding global economy, which is being disrupted and transformed at rates never seen before, the time for a bolder agenda for creating a stronger and more dynamic culture of cross-border collaboration in the binational Great Lakes economic region, the engine of the bilateral relationship, has come.

Here is a collaborative agenda, facilitated by the Council of the Great Lakes Region, which seeks to fully harness and leverage shared regional economic strengths for building the workforce of today and tomorrow, spurring world-leading science and innovation, and cultivating the entrepreneurs that will produce the companies, goods and services, and jobs that will provide the well-being and prosperity to workers and families across New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Ontario, and Québec.

Companies operating in competitive sectors constantly look at ways to create strategic or leadership positions in businesses by evaluating whether their resources or capabilities provide value, are rare, are hard to imitate, and are organized in a way that can be exploited for long-term, sustainable, competitive advantage. These core competencies, in essence, are what differentiate a company, even an organization or country, from another competitor.

In this regard, the competitive and differentiated advantage of the binational Great Lakes economic region, without a doubt, is the dense concentration and superior capabilities of its higher education institutions – its universities and colleges. Nineteen of the world's top 100 universities are Great Lakes institutions, 1/3 of the top 100 engineering schools in the United States and Canada are in the region, and 15% of the world's top 100 medical research schools are here too.

The proximity of these institutions to the advanced, highly-integrated industries and companies that have been created over generations is also a key strategic advantage, from the 57 Global 500 Companies that are headquartered in the region and over 8.0 million small and medium-sized businesses in the Great Lakes that employ millions of people, to the many other multinationals that do business in the region.

This paper sets out a framework for facilitating and funding deeper cross-border partnerships and programs between higher education institutions, and then among regional education institutions, businesses, and governments, in order to help:

- companies address the widening talent gap in the region and to develop the future workforce;

- the binational Great Lakes economic region further develop as a cross-border and global hub of applied science and advanced innovation; and,

- connect institutional and industrial assets, such as business incubators and accelerators, across the border to help entrepreneurs and their companies scale and succeed.

By purposeful organization and strategic development of industry-specific core competencies, the binational Great Lakes economic region can position itself as the place to learn, the place to innovate, and the place to work. In today's climate of faster and faster global commerce, innovation, investment flows, and labor mobility, time is of the essence in being bolder than ever about our shared future.

Introduction

Today's globalized, tech-driven, knowledge economy rewards innovation and the mobilization of highly educated talent, whether from local sources or global markets. Ultimately, the economy grows where talent "lands" and congregates.

As a result, leveraging Great Lakes higher education institutions and cross-border partnerships and programs to train students and workers, to organize an agile, skilled workforce, and to spur cutting-edge innovations, industries, and businesses has never been more important.

The binational Great Lakes economic region rose to economic might once, as immigrants and migrants flooded into the region, powering the farming, manufacturing, and scientific revolutions that were the driving source of economic output, prosperity, and well-being in the United States and Canada during the last century.

From the production of food and farm equipment, iron ore, steel, automobiles, and chemicals, to the manufacture of consumer and durable goods, the region's companies became household brands and global enterprises – names like Dow Inc., SC Johnson, 3M, Proctor & Gamble, Kellogg, Heinz, Sherwin Williams, Parker Hannifin, Whirlpool, Eli Lilly, Ford, General Motors, and Massey Ferguson.

But, as the economy shifted in the 20th century from one driven by brawn and labor-intensive assembly line manufacturing, to that of knowledge and the disruptive innovation that characterizes today's 21st century economy, the region, made up of the eight U.S. states of New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin and Minnesota, and the Canadian provinces of Ontario and Québec, saw its industrial base decline.

Many iconic communities – Buffalo, Pittsburgh, Cleveland, Detroit-Windsor, lost their anchor employers, identity, and place in the international economy, especially as a result of the dramatic industrial restructuring that took hold thanks to new global competitors, automation, and ongoing business process innovations.

New forces are continuously reshaping the economy, the occupational landscape, and the economic prospects and vitality of the binational Great Lakes economic region and its workers. Forces that are accelerating change at rates we have never seen before, including:

- **Disruptive technologies and the internet-of-things**: Artificial intelligence and automation threaten to eliminate 70% of today's low-skill jobs and 46% of today's middle -skill jobs over the next 20 years;[i] yet they are also creating new opportunities and occupations that were heretofore unconsidered and unimaginable.

- **Changing skill-sets**: Rapid changes in the marketplace keep evolving the skills needed by companies and public sector organizations, placing a growing premium on higher levels of digital sophistication, technical expertise, as well as "soft" but critical skills in communication, problem-solving, creativity, team-leading, and project management. In other words, skills responsible for success in today's workplace.[ii]

- **Attributes of place**: Lifestyle preferences of an increasingly mobile workforce are shaping the landscape of economies around the world and determining where talent wants to live and work. Communities that have or that create the right conditions, such as high quality of life or unique lifestyles, connectivity, improved amenities, or even community values like commitments to urban sustainability and social justice, all serve to nurture, attract, retain, and connect talent, while contributing to local economic success.

- **Inclusive growth**: Tightening labor markets and changing demographics are driving a new imperative. Namely, communities and regions need an affirmative talent-building strategy to engage a more diverse population and to make real, inclusive talent preparation efforts that take advantage of all residents and their competencies, including historically marginalized populations including people of color, the poor, and those individuals that are deemed to be unskilled or under-skilled.

- **Climate change**: The reality of climate change is catalyzing a reworking of community and business systems for sustainability and resilience, creating new markets and demands for sustainable solutions, products, and services while affording locational advantages to regions like the binational Great Lakes economic region (e.g. predictable weather, access to fresh water, relative food abundance, limited natural hazards, etc.)

- **Post-pandemic economy:** The COVID-19 pandemic and the freeze on economic activity and global mobility it engendered will recede, but the economy it leaves behind will be reshaped. Analysis[iii] by the Brookings Institution suggests the impacts will vary from region to region, with manufacturing-reliant geographies like the binational Great Lakes economic region potentially being the hardest hit. With the likelihood of high bankruptcy rates and steep job losses due to the pandemic, along with accelerated automation in the workplace, contributing to a growing mismatch between available or laid-off talent and the skills required in the post-pandemic economy, there will likely be widening skills shortages, and a set of workers ill-equipped to transition or emerge successfully from a pandemic induced recession.

In the face of these major, cross-border, labor market forces in the Great Lakes, and in response to the other changes sweeping across the economic and occupational landscape, government and industry face mounting pressure to do more to support worker transitioning and adapting to sectors that are rapidly changing, and to ready tomorrow's workers for a future economy that does not yet exist.

At the same time, government and industry in the binational Great Lakes economic region are feeling the pressure to create an enabling, collaborative environment for pushing the boundaries of science, innovation, and entrepreneurship in the race to compete and win in new sectors and businesses.

All of this presents the Great Lakes with a challenging but rare opportunity. The opportunity to leverage the region's world-leading educational institutions – a purpose-built, robust network of colleges, universities and training academies that are well positioned to meet the talent, innovation, and entrepreneurship needs of employers and governments furiously working to adapt to a changing economy and strengthen their competitiveness.

In short, the Great Lakes region's higher education institutions, coupled with the region's advanced industrial base, are the region's competitive, differentiated advantage in the short and long-term. However, to connect and harness their strengths and assets, **a bolder agenda for organizing and supporting impactful, cross-border collaborations between Great Lakes higher education institutions, and then among institutions, businesses, and governments, is required**.

This is the case outlined by this paper. The urgency to get on with this work is pressing, for the regions that are home to the global centers of talent building, innovation, and entrepreneurship will own the economy of the future. Making it happen, through the creation of a public-private sector roundtable and fund under the auspices of the Council of the Great Lakes Region to enable durable collaborations to form, will be central to the region's long-term success and agility in the new economy.

A HISTORY OF INNOVATION AND SKILLS DEVELOPMENT IN THE GREAT LAKES

The region's greatest economic asset is its network of higher education institutions, many of which date back to the early stages of European settlement and industrialization in North America. These institutions have been central in attracting workers to new urban centers and rural communities, as well as fueling growth in jobs and businesses in key sectors, such as food, forestry, clothing, manufacturing, and a wide range of other services.

In the United States for example, a host of private and religious higher education institutions were founded by the leaders who settled the states that were then America's frontier. They were built to train up men and women of faith and to mark new communities as leaders in learning and advancement, enticing other learned people to settle in the area.

Soon after, some of America's first public universities, like the University of Michigan (1819) and the University of Wisconsin (1848), were organized by the new states to extend higher education to their citizenry. The Morrill Land Grant College Act, enacted in 1862, then gave the new "Western" states land to sell in order to create higher learning institutions.

The first of these institutions, referred to as Land Grant Universities, were founded in the Great Lakes and were revolutionary, as they were specifically designed to support commerce, agricultural, and industrial innovation and dissemination, and to allow millions of people to reap the benefits of public higher education who otherwise could not afford to do so.

Canada's higher education institutional development had its own unique path. In French speaking Québec, from the founding of the Québec Seminary in 1668, the educational system followed the forms of the Jesuits of France. College Sainte Marie de Montreal was created in 1848 by the Jesuits, and three years later, in 1851, the Université Laval was founded in Québec City as the first major French language higher education institution.

Similarly, places of higher education in English-speaking Canada were largely shaped in the model of English, Scottish, and Irish universities, including the examples of Oxford and Cambridge.

The earliest colleges invested with the church of England/Episcopal religion included the three King's Colleges—first in Windsor, Nova Scotia (1788), then in Fredericton, New Brunswick (1800), and finally in Toronto, Ontario (1827).

McGill University, located in Montreal, Québec, was also opened by Royal Charter in 1821. Scottish influence expressed itself in the development of other rival institutions that were open to all comers irrespective of religion, including Queen's University in Kingston, Ontario, in 1841.

Today, and because of this rich history, the binational Great Lakes economic region is home to one the largest, most successful networks of universities in the world, producing close to 50% of American and Canadian university graduates across all disciplines.

Particularly potent are the region's 22 top tier research universities that rate among the top 200 in the world, a number greater than any other comparable region. These include four Canadian institutions (McMaster, McGill, University of Toronto and University of Montreal) alongside research universities in the United States like Carnegie-Mellon University, University of Michigan, University of Chicago, and Notre Dame.

In an era when the growth of emerging sectors, from IT and health care/bio science, to new energy, water, mobility and food solutions, comes from the interplay of research institutions, companies, new entrepreneurs and the investors who exploit their ideas and develop new technologies, these institutions in particular are the hinges upon which the Great Lakes, American, and Canadian economies pivot.

On the United States side of the border, a significant portion of the research and development (R&D); science, technology, engineering, and mathematics (STEM); and, management talent built by the region's university base is anchored by the "Big Ten" academic alliance,[iv] one of the largest university networks in the country.

The 14 mostly Midwestern schools of the Big Ten enroll 600,000 students from the region and world, employ 50,000 faculty, and conduct $10.6 billion in funded research, more than the Ivy League and the University of California system combined.[v]

On the Canadian side, nine of the "U15," Canada's 15 top tier research institutions, are located in Québec and Ontario. Led by powerhouses like the universities of Montreal, McGill, Toronto, and McMaster, these schools are responsible for the lion's share of the more than $9 billion in R&D done each year by U15 institutions and most of the 81% of Canada's university patents. These leading research institutions are complemented by a network of publicly funded regional universities – 24 in Ontario and 18 in Québec.

The Québec post-secondary system has another unique feature. Instead of entering university or college directly from high school, students leave secondary school after Grade 11 for CEGEPS, the French acronym meaning General and Vocational College, to complete an optional finishing year of high school, to earn a diploma, or as a prerequisite to university. Today, 48 CEGEPS operate in Québec. Limited research has been conducted on the effectiveness of this model in terms of skills development and student success.

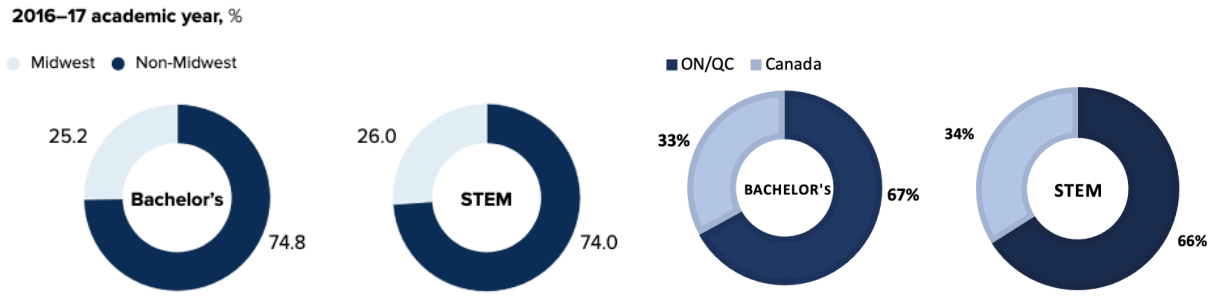
In addition to the vast network of universities, the higher education landscape on the United States side of the Great Lakes includes the first and largest community colleges. Joliet College in Joliet, Illinois, was the nation's first, and higher education institutions like Macomb College outside Detroit, Michigan are among the nation's largest and most innovative Community Colleges. Established in 1967 in Toronto, Ontario, Humber College Institute of Technology & Advanced Learning is Canada's largest college.

These institutions proliferated in the American Midwest and eastern Canada after World War II, as community and business leaders recognized a high school degree was insufficient for acquiring the technical skills needed by employers in the fast-growing industries of the 20th Century.

All told, the binational Great Lakes economic region is home to well over 2,600 accredited higher education institutions, making it a network of education, technical and applied research, and talent generation that is unrivaled anywhere else.

THE PLACE TO LEARN

As the figure below illustrates, the binational Great Lakes economic region, which straddles the Northeast-Midwest region in the United States and portions of eastern Canada, produces a large share of both nation's "talent," an essential ingredient for succeeding in the new 21st century economy.



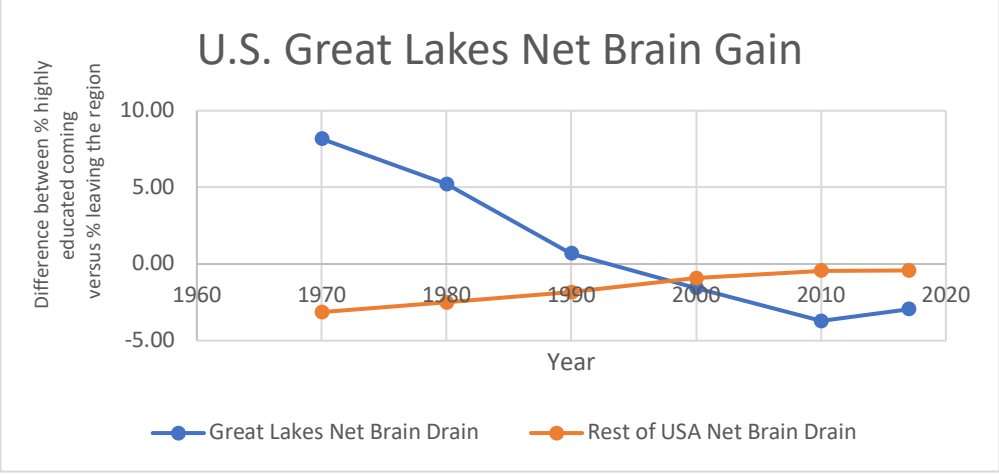
With today's knowledge economy rewarding the most talented and best educated, and the communities these skilled experts call home, this density of "talent" provides unique advantages to the Great Lakes. However, while the region, given the size and scale of "output" from its network of higher education institutions, has always been a big talent producer, for many years much of the region saw its talent exported outside the its boundaries.

In other words, though a significant number of students choose a Great Lakes institution for advanced and technical education and skills development, too many of them, including those who are "from" the region, go elsewhere in search of where to live and work upon graduation. While the story is somewhat different in Canada, the region's "rust-belt" or "forgotten region" moniker in the United States, which depicts a region in decline and dominated by the industries of the "past", has not helped.

There is some evidence, however, that this "brain drain" is now turning, in part because many areas of the region are reconnecting to their institutions of higher learning and capitalizing on the role that these institutions and their economic assets can play in economic development.

Cities like Pittsburgh, once losing its young, educated residents – long past the collapse of the steel industry – are now seeing them flock back to participate in the tech, robotics, AI, and medical technology revolutions going on there. These revolutions are largely catalyzed by the innovations and talent spilling out of the former "Steel City's" research and learning institutions, notably Carnegie-Mellon and University of Pittsburgh. Minneapolis, Indianapolis, Columbus, and even Detroit are seeing the same dynamic, as new tech-savvy young people flock to these iconic cities to participate in and help drive a rebirth, a rebirth hinged on university-led innovations, and other "anchor institutions" like medical teaching and research complexes.

The figure below shows that, across the portion of the Great Lakes region in the United States, the historic "brain drain" could be reversing, with the share of those staying in the region and moving to the region ticking upwards after a decade of highly educated people leaving the region in greater numbers than they were being replaced.



In the Canadian province of Ontario, beyond the greater Toronto region, which is a thriving global metropolis, some of the older blue-collar towns and economic hubs like Hamilton, Windsor, and Sarnia have experienced historic "talent" losses as well, as global and cross-border supply chains shifted, anchor industries changed, and work moved elsewhere.

Overall, Ontario and Québec, Canada's historic population centers, were the largest net losers of people and talent from 2006-2016 as a result of interprovincial migration and shifting economic prospects across the country, sending 196,666 citizens elsewhere in the country for a variety of reasons, including work.[vi]

In more recent years however, while Québec continued to lose people, Ontario saw positive interprovincial migration for the first time in 2015-16 since 2006, with a net gain of 9,077 people, very likely as a result of the new industries and job opportunities in the province.

As new businesses and jobs in emerging sectors continue to grow in Canada, and as immigrants move to Canada in increasing numbers, the future of Ontario, a province home to one in three Canadians and to 40% of Canada's economic activity, as well as communities along the St. Lawrence River in Québec, looks very promising.

Universities and colleges have been important catalysts for this renewed growth and economic activity on both sides of the border. This is good news for the competitiveness and success of the binational Great Lakes economic region, and a regional phenomenon that can be deepened and accelerated by the development of purpose driven cross-border partnerships and programs between higher education institutions, businesses, and governments described later in this paper.

THE PLACE TO INNOVATE

Great Lakes academic institutions are innovation hothouses, that, working with key collaborators such as private sector R&D leaders, financiers, entrepreneurs, government and economic development organizations, turn new ideas, discoveries, and technologies into new products, services and business systems.

The scale of Great Lakes regional innovation is already remarkable. The United States portion of the region accounts for 24 % of total American R&D funding and 26% of patents in the United States, while the Canadian portion accounts for roughly 72% of R&D funding and 68% of patents in Canada. These assets position the region to support growth in current sectors of comparative advantage, as well as nurture additional businesses and good-paying jobs in a host of fast-emerging global business sectors.

The report, *Clusters and Regional Economies: Implications for the Great Lakes-St. Lawrence Region (2015)*, prepared by Dr. Christian Ketels, for the Conference of Great Lakes and St. Lawrence Governors and Premiers, identified cluster strengths in a number of areas, and in some cases fast growth, including advanced manufacturing, autos, and agriculture /food systems, but also financial and business services, IT and analytic instruments, and water technology and system building.

Further, as detailed in the 2020 Chicago Council on Global Affairs, *A Vital Midwest* report,[vii] today's global challenges provide an opportunity for business growth and job creation in the "Green and Blue" economy – sustainable green sectors, but also other emerging sectors key to solving global sustainability including water technology and innovation, new mobility systems, and new food solutions for an urbanizing planet. Business sectors with large global growth markets and high social impact include:

- **Water solutions**, a growing $891 billion market (2017)[viii]
- **Data analytics and information technology**, a $3.76 trillion market (2019)[ix]
- **Energy solutions**, a $1.35 trillion global market (2016)[x]
- **Food systems**, a $5 trillion market (2015)[xi]
- **Transportation and mobility**, an $8.1 trillion market (2015)[xii]
- **Health and bioscience**, a sector that makes up more than 17 percent of the US economy,[xiii] directly employs 1.2 million people, and exports approximately $90 billion (2017)[xiv]
- **Advanced manufacturing,** with applications across a variety of sectors, from healthcare to aerospace to water sensing devices to bioengineered human body replacement parts

Here, again, the binational Great Lakes economic region, especially on a cross-border basis, has the key research, manufacturing and services, and innovation strengths in its colleges and universities to be the center point of new ideas, technologies, and talent generation in these fast-growing fields in both countries. The region can also be the cross-border sandbox for entrepreneurs and companies that want to build and scale prototypes, commercialize promising innovations, and then take their know-how to the world in the form of goods, services, or systems exports. Take, for example, these assets across the region:

- Of the Top 100 medical research schools in the world, 15 are in the Great Lakes region including 12 on the United States side, and three on the Canadian.[xv] And fully eight of the top 15 Canadian medical schools are located in Ontario and Québec.[xvi]

- Eleven of the world's top engineering universities (central to translating innovations into tangible new products and services) are in the binational region[xvii], and the Great Lakes is home to over 1/3 of the America's and Canada's top 100 ranked engineering schools.

- The region's universities and colleges are also home to a large share of American and Canadian technical studies and applied research programs that are leading the way in clean energy development, new water solutions, food system innovation, computer science and IT technology development, and new mobility solutions – among other fields of study at the forefront of global innovation and economic change.

- Of particular note, given the truly dramatic impact that climate change, water scarcity, and related side effects are having on the planet, the Great Lakes region, with 21% of the world's surface freshwater[xviii], abundant nature, arable lands, and affordability, has the opportunity to be a globally-unique, long-term sustainable platform for agriculture, industry, smart urban living, climate resiliency, clean energy, and other burgeoning technologies.

Leveraging the learning and research engines of Great Lakes institutions to create regional growth and jobs and businesses in emerging cross-border sectors, will also become increasingly critical in a post-pandemic economy and a critical component of efforts to recover from a pandemic-induced recession – an economic collapse that will be unlike anything we have seen before.

For instance, there is evidence that jobs and workers in small business and "old economy" industries like traditional manufacturing tend to be most disrupted by large recessions or cataclysmic economic events.

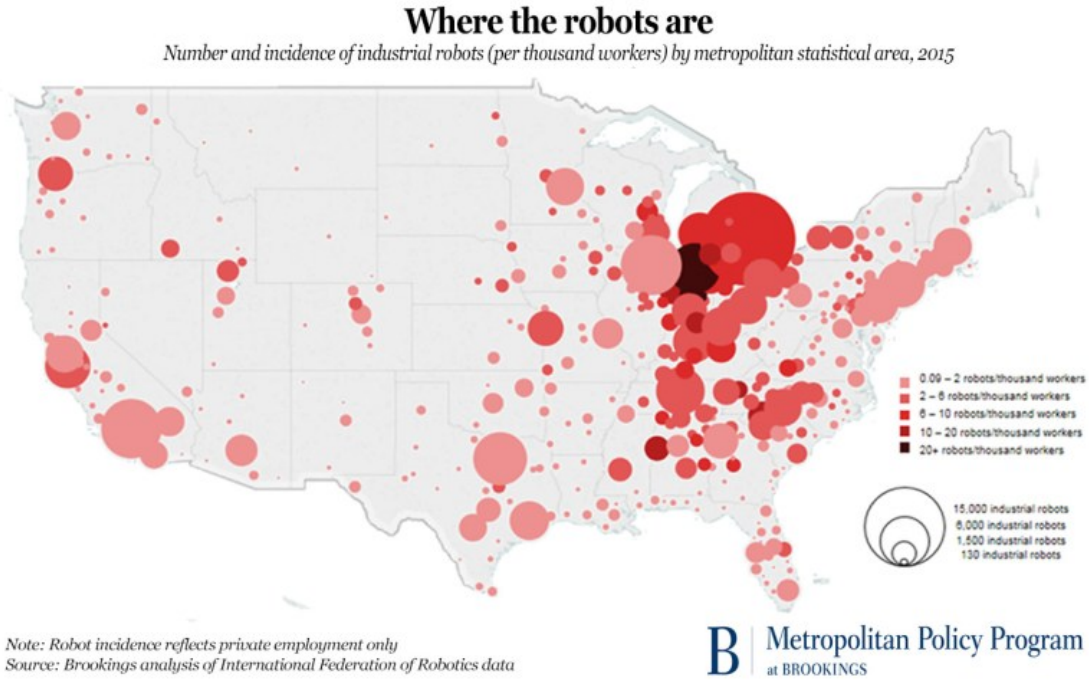
Therefore, spurring the creation of higher value, knowledge intensive jobs and businesses in emerging sectors, and equipping students and current workers on both sides of the border with the skills to take these jobs and allowing them to fully participate in a radically changed economy, will be more urgent than ever for the region.

THE PLACE TO WORK

Under competitive pressures to cut costs and improve quality, companies in many sectors over the last 40 years began to dramatically restructure their business models and rely on greater automation of production, leading to the loss of many high-paying, low-skill jobs in communities across the binational Great Lakes economic region.

In fact, the greatest concentration of robots doing jobs formerly occupied by humans are in regions where manufacturing industries dominate. The figure below from the Brookings Institution vividly illustrates this for the Great Lakes states. The same story is playing out in Canada.

Figure: Number of robots by metropolitan statistical area (per thousand workers)



Source: *Mark Muro, "Where the Robots Are," Brookings Institution, August 14, 2017*

As wholly new occupations are created almost overnight as a result of automation and the digital revolution, other occupations nearly disappear at the same speed. Workers in a changing jobs market, rightly, are therefore full of anxiety and in many cases feel left out and left behind by the new economy.

Analysis from McKinsey suggests that while occupations will fundamentally change or even cease to exist, innovation and economic growth will create new jobs. Eight percent to 9% of labor demand in 2030, for example, will be in new types of occupations requiring combinations of skills that have not existed before:

> *"75 million to 375 million workers may need to switch occupational categories and learn new skills. And for advanced economies like the U.S., the share of the workforce that will need to learn new skills and work in new occupations is much higher: up to one third of the 2030 workforce in the U.S."* —*What the Future of Work Will Mean for Jobs, Skills and Wages, McKinsey.*

In fact, outlooks from BMO Financial Group show the industrial and occupational shift already underway in the binational Great Lakes economic region. For example, the bank, in its 2017 state of the Great Lakes economy outlook, reported that while manufacturing lost one million jobs over a ten year period, likely due to a combination of automation and the fallout of the Great Recession, the education, healthcare, and professional services sectors added 2.5 million jobs over the same period, easily replacing the losses from manufacturing.

Across the region however, reports from employers, state and provincial government agencies, and chambers of commerce of worker shortages in many sectors and occupations, especially skilled laborers and high-skilled professionals in knowledge-driven industries, are on the rise and are of great concern to Great Lakes policymakers and business leaders. A survey of recent headlines, admittedly before the pandemic, captures the worries about the regional talent gap well:

- *Pennsylvania Department of Labor and Industry Discusses Skilled Labor Shortage at Recent Roundtable:* Pennsylvania Business Central[xix]
- *How Ohio is Working to Solve the Workforce Gap*: Columbus Business Journal[xx]
- *High-employment, labor-shortage, aging workers, create-issues*: Lansing State Journal[xxi]
- *Labor Shortages: Indiana Manufacturing Survey:* Indiana University[xxii]
- *Minnesota's Workforce Shortage:* Minnesota Compass[xxiii]

And, the condition on the Canada side of the Great Lakes was no different:

- *Canada's skilled labour shortage: What does it mean for workers and employers?* Toronto[xxiv]
- *The Skills Mismatch: Navigating Disruption in Ontario's Labour Market:* Ottawa [xxv]
- *Québec Government Urged to Increase Immigration to Tackle Chronic Labour Shortage:* Québec City[xxvi]

According to the Korn Ferry Research Institute, the global talent shortage could reach 85.2 million people by 2030 – costing companies trillions of dollars in lost economic opportunity.[xxvii] The three sectors that will be hit the hardest from the talent shortages, which are all key features of the binational Great Lakes economic region, are **financial and business services** (10.7 million workers short), **manufacturing** (7.9 million short), and **technology, media and telecommunications** (4.3 million short).[xxviii] More research to understand specific gaps in the Great Lakes region, however, is required.

Perhaps even more concerning, is that all of the occupations identified by the Korn Ferry Institute will demand higher forms of education and skills, be it a postsecondary degree, certificate or credential. And so, only those workers with the requisite critical thinking, digital literacy, project management, and interpersonal communications skills to adapt and thrive in a fast-changing and automated employment landscape, the skills gained through higher and higher levels of postsecondary education and technical training, will survive and thrive during these rapid transitions. Herein lies a major challenge ahead for the Great Lakes region.

Thirty percent of workers across seven Midwest states in the United States have only a high school diploma, compared with a national average of 28%. The estimate is as high as 36% in Pennsylvania and 34% in Indiana and Ohio, states historically reliant on low and mid-skill manufacturing employment.

The provinces of Québec and Ontario boast higher education attainment rates amongst working age adults than most of their Great Lakes peers in the United States. Still, in manufacturing heavy parts of both provinces, a surprising proportion of the workforce only has a high school diploma.

The workforce challenges facing the region will also be exacerbated by the region's aging population. Demographic projections in the region, on both sides of the border, suggest that unless significant changes are made, Great Lakes states and provinces will face an economic downward spiral as a result of the growing share of older workers and elderly who have retired from the labor market. Considered another way, absent the influx of younger, skilled workers and entrepreneurs, it will be very difficult to create the prosperity necessary to maintain economic growth and sustain the broader societal needs we have become accustomed to.

Compounding the challenges for employers and employees is the accelerating trend away from long-term, stable, full-time positions toward contingent, alternative work arrangements – codified as contract work or the gig economy. Increasingly, individuals, not employers, must identify the skills and credentials they need to navigate a changing employment environment.

Finally, as previously noted, the likely severe recession that will be caused by the pandemic, and the detrimental impact it will have on every size of business, as well as on existing workers and their current and future employment prospects in much of the Great Lakes region, will only increase the need for aggressive upskilling and retraining programs and initiatives.

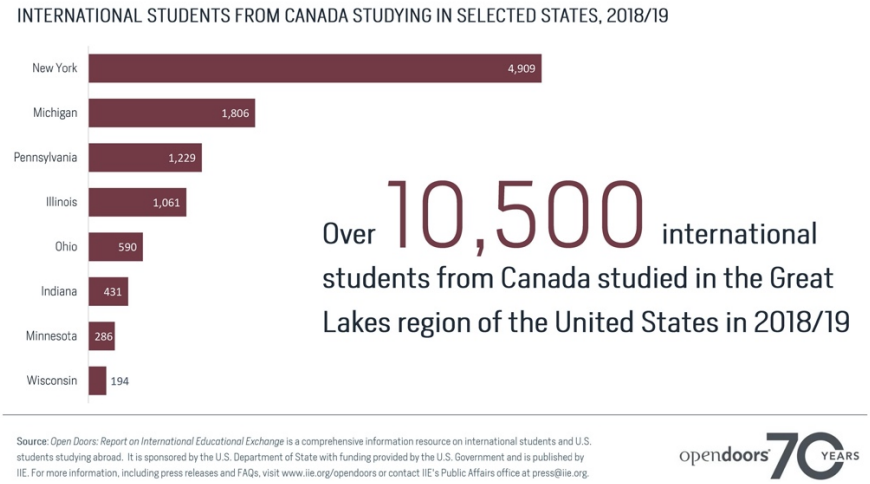
Therefore, as all of these manifest challenges unfold at an unbelievable pace and unpredictable manner, absent aggressive, cross-border talent development initiatives, as well as up-skilling and re-skilling retention efforts, the regional talent crunch, colored by age, race, and education attainment levels, will undoubtedly worsen and widen in the binational Great Lakes economic region.

Consequently, Great Lakes higher education institutions, working collaboratively together and jointly with business and government through the Council of the Great Lakes Region, can and must play a leadership role in organizing and integrating education and workforce development efforts by deepening their cross-border partnerships and programs.

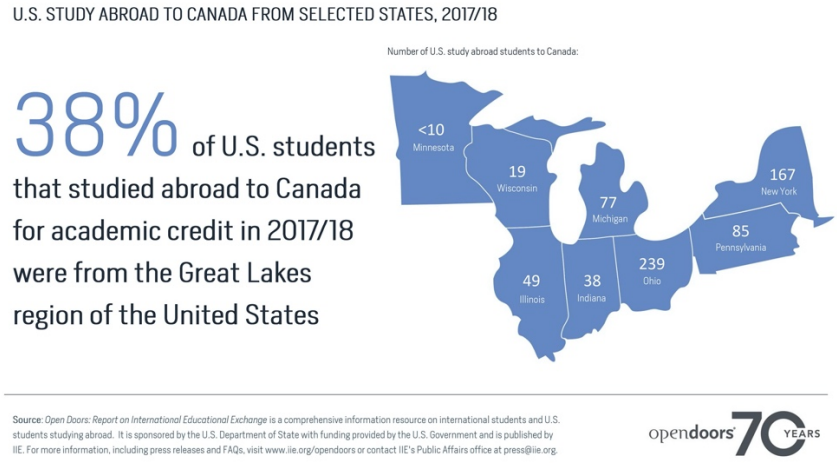
THE STATE OF STUDENT MOBILITY AND HIGHER EDUCATION PARTNERSHIPS

In 2017, with economic output estimated at US$6.0 trillion, the region, if it were a country, would be the third largest economy in the world, behind only the United States and China. It is also responsible for more than half of cross-border trade between Canada and the United States. However, for two countries that share such a highly integrated economy and deep cultural connections, outside of faculty-to-faculty research, our Great Lakes higher education institutions and students are not finding each other across the border.

Canada, as a place of origin for students taking part in a study abroad program in the United States for academic credit, only ranks in the top five contributing nations in three of the eight Great Lakes states, where China and India are number one and two overall. Of the 10,500 Canadian study abroad students at institutions in the Great Lakes states, almost half land in New York (4,909), with others going to Michigan, Pennsylvania and Illinois and only handfuls choosing Minnesota and Wisconsin.



Regarding the flow of American students going to Canada as part of a study abroad program, according to the Institute of International Education, which produces the Open Doors report on American students studying abroad for academic credit at their home colleges or universities, 1,786 U.S. students are studying abroad in Canada. Of these students, 38% hail from the Great Lakes Region.[xxix] Another 2,253 students from the United States study in Canada as part of non-credit experiential activities.



However, this does not tell the full story of American students in Canada. According to the Institute of International Education and the Canadian Bureau for International Education, data from Project Atlas shows that there are some 13,000 students with a citizenship from the United States attending a Canadian college or university to pursue a full degree or diploma, with over half of them choosing Ontario and Québec as their place for study. To complete the picture even more, American students represent only about 3% of the close to 435,415 international students attending a higher education institution in Canada, with China topping the list again, representing 22% of Canada's international enrolments.

Institutions and education experts in the region who were interviewed for this paper suggest that there are many reasons for the relatively low number of American students choosing Canada as their place of study abroad for academic credit or any other purpose compared to other countries. One of the principle reasons is the fact that American students like to select an international destination for their study abroad experience that is more exotic than the country next door. Interestingly, they also do not view these study opportunities as pathways for advanced skills development or work.

Studies conducted in Canada also show that American students who choose Canadian institutions do so because of the appeal of familiarity in terms of culture and being close to home. In other words, a place that is not too far outside their comfort zone. As well, when American students choose Canada, they do so because it can be a more affordable option, particularly for those who do not have funds to travel further afar.

Canadian students, somewhat differently, actively pursue learning opportunities with American institutions, often to attend a prestigious institution or to be able to pursue cross-boundary careers in the highly integrated businesses and industries of the region (e.g. automotive production and management, food system production and services).

Overall, the number of American and Canadian students actively participating in learning opportunities on the other side of the border, for whatever purpose, is, to put it bluntly, underwhelming for two nations who share one of the most successful economic partnerships in the world and whose future in a globalized, knowledge-driven economy is so deeply entwined.

The competition for talent, R&D investments and innovation, new businesses, and jobs is already fierce. So, there is a clear choice in front of both countries and the binational Great Lakes economic region. If we want to win globally, then a very different path forward needs to be charted - one that unleashes the full power of our cross-border socioeconomic strengths and assets, beginning with our institutions of higher learning and science, in order to get students and workers ready to lead a technology driven economy, to conduct advanced science, to innovate and commercialize more quickly, and to build successful businesses faster in the region. Clearly, there is a strong foundation upon which to start.

One of the longest standing initiatives, Fulbright Canada, is a binational, non-profit Foundation established by treaty 25-years ago. The Fulbright program, an initiative of the United States Department of State supported by Global Affairs Canada, has provided exchange opportunities and financial assistance to students, scholars, teachers, and independent researchers through a variety of advanced learning programs, which are open to individuals in all academic fields with the exception of medical training.

Further, while there is no explicit federal strategy in the United States for international education, it does have initiatives to catalyze international learning partnerships and facilitate exchanges. The 100,000 Strong in the Americas Fund, organized through the United States Department of State, American Embassies, Partners of the Americas, and the NAFSA: Association of International Educators, stimulates new higher education partnerships between the United States and the Western Hemisphere.

Through the 100,000 Strong in the Americas Fund, the United States has built public-private partnerships and attracted philanthropic, government, and corporate funding to provide grants to jump start applied learning and research partnerships among and between cross-border higher education institutions in the America's, including in Canada[xxx]. Since its inception, however, only two projects between American and Canadian institutions have taken place due to a lack of funding.

The Government of Canada also supports and subsidizes cross border programming with the United States, to a certain extent. The Social Science and Higher Education Research Council, for example, organizes multi-disciplinary, cross-border research and training collaboratives including: 1) a Talent program to support students and postdoctoral researchers in order to develop the next generation of researchers and leaders across society, and 2) the New Frontiers in Research program that supports international research collaboratives in part.

Mitacs, a national non-profit in Canada, funded in part by the Canadian government, has delivered research and training programs in Canada for 20 years. Through its Globalink Research Award program, Mitacs provides CDN$6,000 for senior undergraduate and graduate students, and postdoctoral fellows in Canada to conduct 12–24-week research projects at universities overseas.

Finally, there are semi- durable, binational research partnerships, such as the Transborder Research University Network and its focus on science and policy designed to protect and conserve the health of the Great Lakes. A handful of other learning collaboratives have also been created by the region's higher education institutions, including the following:

- McMaster University's Department of Communication Studies and Multimedia, the Degroote School of Business and Syracuse University's S.I. Newhouse School of Public Communications, since 2007 have collaborated on a Master of Communications Management program for professionals training in the fields of communications, marketing, government relations, brand management, and social and digital media. The program brings together core MBA courses and strategic communications and market research courses to deliver the knowledge, skills and confidence U.S. and Canadian students need to take their careers to the next level.

- In a similar, but more expansive program, Queen's University and Cornell University operate an Executive *MBA in Americas* program that brings together two of their respective nation's premier business schools to deliver MBA programs in six Canadian and 20 U.S. cities, recently expanding to also include four locations in Latin America. Graduates get the benefit of joint degrees, and are considered alumni of both elite schools, and make learning and networking connections across the hemisphere.

- Another variant of this type of joint program offering is a partnership between the Schulich School of Business at York University and Northwestern Universities' Kellogg School of Business. This program puts a prestigious Executive MBA program with world-class connections and over 40 specialized elective courses in reach of Canadian Students. Ranked as the top MBA program in Canada, the program allows students to personalize their learning experience while engaging with and benefitting from the diverse perspectives of business leaders from around the world.

- A very different focus for a higher education partnership is represented by the Indigenous Mobility and Curriculum Across Borders initiative operated by the Wilfrid Laurier University and Syracuse University. Catalyzed by a grant from the U.S. Department of State's 100,000 Strong Across the Americas Innovation Fund, this unique initiative allows Native/Indigenous students to trade places, learn about and experience cultures across borders, and develop new ideas for curriculum and programming at both institutions.

- A consortia of Ontario higher education institutions, then joined and facilitated by Wayne State University and its "Techtown" accelerator program, organized a series of short-term innovation competitions bringing student teams together from multiple institutions across the U.S.-Canada border. Student teams compete to develop and pitch new business ideas in emerging sectors to a panel of judges. First focused on health care/biotech (billed as Hacking Health), then on new water technology innovation (Erie Hack), and now on new mobility solutions, the initiative demonstrates how short-term competitions, sustained by longer term partner development programs, can nurture new ideas, technologies and entrepreneurs at a growing scale.

- The University of Guelph offers students a unique binational knowledge-building experience in food systems. Termed the “Midwest Tour,” the Plant Agriculture Field Trip field study course is designed to increase the student's breadth of knowledge of agricultural production and agri-business in North America. Students tour crop and livestock farms, supporting industries (e.g. processing, manufacturing), and markets (e.g. elevators, stockyards) in Midwestern states to develop applied knowledge and networks in the highly integrated agricultural industries in both countries.

- University of Windsor and Wayne State University have forged an exchange program to maximize opportunities for students. The exchange agreement permits University of Windsor graduate and undergraduate students to take courses at Wayne State not offered in Windsor, Ontario.

- Northwood University, is a business-focused university in Midland, Michigan with a teaching emphasis on free enterprise and entrepreneurship. Northwood has developed a number of higher education partnership programs with Canadian institutions targeted at workforce skills development in leading regional industries. With the College of North Atlantic, in Newfoundland, Georgian College, in Barrie, Ontario, and Humber College in Toronto, Ontario, for example, Northwood University offers joint programs in the areas of Automotive Marketing and Management, Aftermarket Management, Accounting, Management, Marketing and Sports Management. Northwood also partners with Lambton College in Sarnia, Ontario, to offer degree programs in China.

- In a similar vein, Trocaire College in Buffalo, New York serves two key needs: technology and healthcare. Trocaire students, most of whom are adult degree completers who are already working and have family and community commitments, reap the benefits of cross-border learning when: Ontario students enroll in its in-demand nursing programs (because the two countries share a common licensure exam) and the College uses clinical instructors from the province just miles away across the Peace bridge. At the same time, new programs in cybersecurity and data analytics are looking to place students in program capstones with major employers and institutions to improve the talent building in the home community while enhancing the Buffalo-Niagara-GTA communities’ attractiveness to employers and supporting ongoing economic development and collaboration.

- Focusing on commonly shared labor exchanges across the U.S. and Canada border, Michigan State University reserves a set number of competitive enrollments for Canadian students in its College of Osteopathic Medicine. Additionally, the Osteopathic Medicine College provides a tuition stipend to the selected students to compensate for the higher currency rate and relieve financial burden for those pursuing the D.O. Degree, which is not obtainable in Canada. Michigan State also hosts a dual Law degree with the University of Ottawa through an agreement held between the universities for two

decades. Students split their time and studies between campuses. Upon graduation, their degree is acknowledged by both law schools, permitting them to take the bar on both sides of the border and earning the right to practice in the U.S. *and* Canada.

Taken together, these initiatives demonstrate the high potential that exists for growing cross-border collaborations between higher education institutions in particular, but also between these institutions, industry, and government economic development, labor, and education/training agencies, to turn the region into an epicenter of talent development, world-leading science and innovation, and entrepreneurship.

However, there are issues that must be confronted if we are to deepen and expand partnerships and programs between a greater number of Great Lakes higher education institutions, and by extension their students, researchers, their economic assets (e.g. incubators/accelerators, etc.) as well as their industry and government partners.

For example, experts interviewed for this paper suggest that we need to aggressively market the advanced learning and ground-breaking science that is happening in the region, and the opportunities for high-skilled talent to connect to the region's industrial base and find meaningful work. Students and faculty have to know that the path to learning about and solving the world's problems through research or business can start and end in the Great Lakes, from climate change adaptation and sustainability, to advanced materials and manufacturing, the future of mobility, life and bio sciences, smart water technologies, new sustainable and equitable food systems, and much more!

Many binational partnerships and programs have been created, operated, and then, due to funding or shifting priorities, discontinued. The "on again, off again" nature of these cross-border initiatives works against the institutional support necessary to keep a quality binational partnership and program going and growing. And, in many cases, businesses and government were not at the table when partnerships and programs were being contemplated, initiatives that are ultimately trying to respond to their specific talent, innovation, and business building needs and interests.

Furthermore, at a time when many higher education institutions are keen to attract additional students or support international faculty collaborations, the hurdles associated with tuition or living costs (exacerbated by exchange rate differences) also work to discourage student and faculty interest, and in the long run, the durability of the cross-border partnerships and programs if they are not structured properly.

Lastly, if we truly want to fully harness the cross-border power of the binational Great Lakes economic region, the binational region must make headway on major policy barriers that create unnecessary obstacles to strengthening our shared competitiveness. Chief among them are visas and the portability of credentials between the two countries.

As an example, registered nurses are one of only a few professions that are accredited to work across North America. This has served the Great Lakes region well during the COVID-19 pandemic, with thousands of nurses from southwestern Ontario traveling across the border every day to work in Michigan hospitals and provide high-quality health care.

If we can replicate this successful cross-border model for other in-demand occupations in the Great Lakes, for today's economy and in the future, the talent pool that could be put to work in service of both the American and Canadian economies in the Great Lakes region would be significant. It would also ensure that the region can compete with other powerful economies and trade blocs, such as China and the Asia-Pacific.

GROWING FROM OUR STRENGTHS – DEEPENING CROSS-BORDER HIGHER EDUCATION COLLABORATION

In his article, NAFTA and Higher Education: The Cultural and Economic Dimensions of Trade, Philip G. Altbach, a Professor and Director of the Comparative Education Center within the State University of New York at Buffalo, said "the universities in all three countries can play an important role in shaping a future in which there is better understanding of the three diverse cultures, and in which the skills necessary for economic integration are available." These words were written over 26 years ago.

Since then, United States' exports to Canada are up 198% from 1993 levels according to the Office of the United States Trade Representative while United States' imports from Canada are up 187%. Yet, over the same period that we have seen the tremendous growth in cross-border goods and services trade, it is safe to say that the level of institutional collaboration envisioned by Professor Altbach has not materialized at nearly the same rate or depth.

Even though neither the United States and Canada, nor the binational Great Lakes economic region, have fulfilled Altbech's vision, the competitive and differentiated advantage of the region remains the dense concentration and superior capabilities of the region's higher education institutions. And, thanks to NAFTA, its advantage in a global marketplace today is also now derived from the proximity of these institutions to a very large, advanced, and highly integrated base of industries and the thousands of small, medium, and large-sized companies that buttress them.

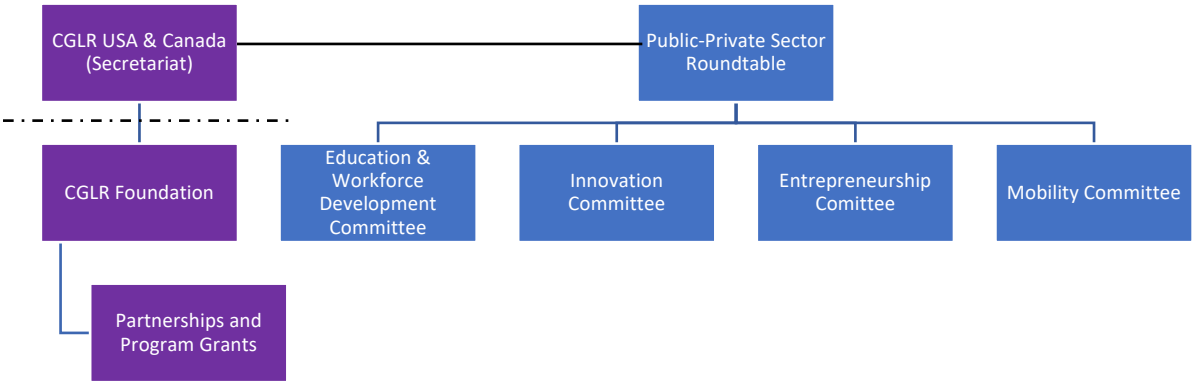
In 1994, Dr. Altbech recommended in his paper that "U.S. colleges and universities must build ties to counterparts in Mexico and Canada through institution-to-institution exchanges, partnership agreements, and the like." By creating dynamic cross-border higher education collaborations, the region can create the talent and agile workforce required to serve the region's economy into the future. The region can also produce the deep science and applied research that will supercharge the region's emergence as a global innovation leader, and the entrepreneurship that will ultimately drive the region's growth, jobs, and prosperity.

Great Lakes Education and Workforce Development, Innovation & Entrepreneurship Roundtable

The formation of a roundtable, hosted by the Council, specifically CGLR USA and CGLR Canada, would provide a unique platform for higher education institutions to connect across borders to discuss a range of regionally significant education, workforce, innovation, and entrepreneurship issues.

More important, the roundtable would provide the impetus for building more regular, impactful collaborations amongst institutions, first and foremost, and then between institutions, companies and government, to find solutions to the problems identified.

A possible governance framework for the roundtable could be as simple as shown below.



A steering committee established and co-chaired by members of the roundtable could oversee the roundtable's work, and the roundtable could further its purpose, or mission, throughout the year by working with the Council to:

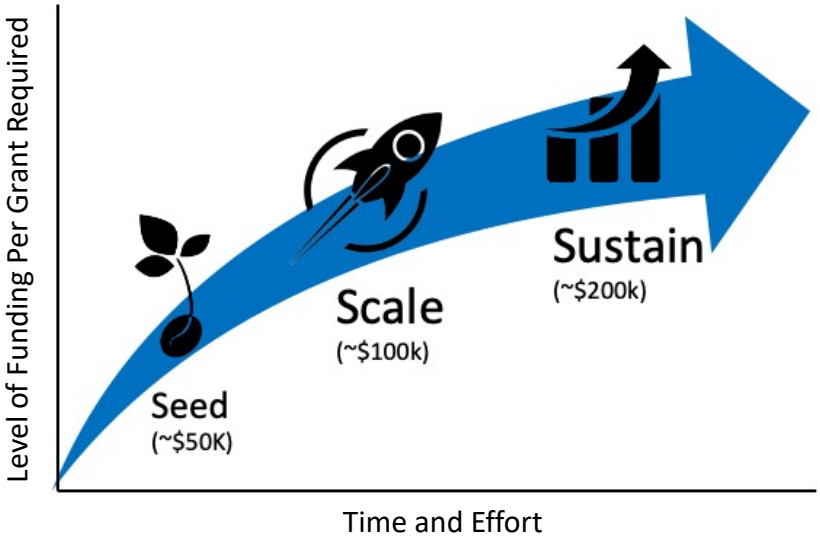
- Convene leaders and experts to share knowledge and diverse perspectives, stimulate debate, and create a context for new ideas and solutions to emerge.
- Research and conduct high quality analysis on regional workforce, innovation, and entrepreneurship issues that matter most to the region's competitiveness.
- Advise on how best to leverage higher education strengths and assets in furtherance of the region's economic priorities, including connecting institutions to industry.

Finally, to build broader engagement and momentum, the roundtable's steering committee and participants could meet at the Council's annual Great Lakes Economic Forum to report on key higher education, workforce, innovation, and entrepreneurship trends in the region, as well as the roundtable's activities and achievements and its planned actions for the coming year.

Seeding, Scaling & Sustaining Strategic Partnerships and Programs

We heard from education experts that in addition to creating a venue for dialogue, adequate funding will be a crucial success factor for nurturing cross-border higher education partnerships and programs that are designed to address the region's most pressing workforce, innovation, and entrepreneurship challenges and opportunities.

Further, we were told that funding to support creative collaborations must be meaningful, and that the process for accessing funding should be straightforward, and as much as possible, kept open throughout the year to allow for greater flexibility in formulating cross-border initiatives. Based on these parameters, a series of grants, similar to venture capital funding for growing start-ups, could be made available by application to the Council of the Great Lakes Region's 501c3 public charity in the United States (the "CGLR Foundation") to seed, scale, and sustain partnerships.



Fueled by investments from the public, private, and other philanthropic interests on both sides of the border, the grant would help finance binational partnerships, from conceptualizing a program between institutions or with business or government, to scaling and sustaining successful initiatives so that they positively impact the region's competitiveness. Some of the partnership ideas that were shared by institutions and education experts include the following:

Regional Workforce Development

Enhanced Experiential Learning and Continuing Education Opportunities

1. Supporting and expanding well-defined, short-term, binational experiential learning opportunities between universities and colleges (e.g. study tours, in-person or virtual courses, case competitions, hackathons, etc.) that leverage the strengths and assets of each institution and strengthen the skills of students and employability of adult learners in high needs sectors.

Expanding Pathways to Higher Learning and Skills

2. Facilitating cross-border curriculum mapping in order to create unique, affordable learning pathways that accelerate advanced learning and skills development for American and Canadian students by designing and offering innovative, cross-border initiatives in sectors with critical talent needs or widening talent shortages, such as 2+2 (two years of community college followed by two years of university).

Bridging Learning and Work

3. Serving the talent needs of highly integrated Great Lakes industries by facilitating partnerships with businesses to hire students for a period of two to three years upon graduation as part of industry-sponsored learning programs and cross-border professional work experiences. This could be modeled on the AmeriCorps program.

Science and Innovation

4. Expanding advanced science and applied research by enabling more faculty and student exchanges to enrich their research and the generation of new ideas and innovations that can be discovered and developed in the Great Lakes.

Entrepreneurship

5. Connecting distinct institutional strengths and assets, such as university-based entrepreneur degree and certificate programs, business incubators and accelerators, in order to enhance the role that institutions can play and the impact they have in turning ideas into companies in the Great Lakes and innovations into commercial goods and/or services.

Other Priority Focus Areas

The recommendations, governance structures, and funding mechanism, which were drawn from our discussions with regional higher education institutions and experts, provide a general framework for building impactful, cross-border institutional partnerships with a focus on skills and talent development through experiential and coordinated learning; deep science and applied research; institution-driven entrepreneurship; and, the commercialization of ideas and innovations alongside industry and government.

However, we know that employers are struggling to upskill and reskill current workers now. Therefore, as a result of the massive re-training crunch we are facing, especially in the aftermath of COVID-19, we recommend that the forum or roundtable and fund should also focus on developing programs that can help companies train and re-train their workforce in order to give employees the modern skills they need to keep them employable and the companies competitive in an economy in recovery and constant transition.

Next, improving the long-term competitiveness and success of the region's interconnected sectors, supply chains, and firms demands that people and their skills be able to move more seamlessly across borders as part of a "unified labor market" for human capital. Therefore, the roundtable or forum, once established, should also investigate ways to increase the mobility of talent in the binational Great Lakes economic region by working to find a solution for the binational accreditation of professionals and the certification of skilled labor, perhaps through negotiating a mutual recognition agreement or inter-state compact.

Finally, during our research for this report, we were mystified by how disconnected efforts have been across the region with respect to building the new economy and workforce. On every level, the region has what it takes to not only compete in the new economy, but to lead it – from the region's world-class learning and research institutions and its industrial prowess, to its ability to offer a quality of life that is second to none – good paying jobs, affordable living, abundant food, diversity and culture, high-quality health care, clean air and water, natural spaces, and more. The Great Lakes is where we can build the future, and the future is now!

Accordingly, the roundtable and fund should consider devoting time and resources to supporting STEM skills and talent development in three to five cutting-edge economic clusters that are emerging in the region and have the potential to be globally (e.g. data science, water, health and bioscience, food systems, advanced manufacturing, etc.). The Great Lakes can take a commanding lead in these fields and others with the right support partnerships between institutions, business, and government. Above all, working together, the binational Great Lakes economic region can be the talent-generating and economic model to beat by those we now see as fierce competitors, including China.

CONCLUSION

The cluster of universities, colleges, and training institutes in the binational Great Lakes economic region is one of the most extensive and successful in the world. These institutions have played, and will continue to play, a key role in building a high-skilled workforce in the Great Lakes; a role that will only grow in importance in the knowledge economy.

At the same time, surviving and thriving in a world driven by innovation and disruption has also heightened the importance of being able to constantly push the boundaries of science, applied research and entrepreneurship. Government and industry also face tremendous pressure to upskill and re-skill workers in rapidly changing sectors, especially in the aftermath of the COVID-19 pandemic.

The region's success therefore, in the short and longer term, rests on adapting to these new realities and taking the lead position in building our future economy, today. The region's ability to succeed, however, is not assured. A bolder agenda for cross-border collaboration amongst Great Lakes higher education institutions is required, as well as partnerships between institutions, government, and business. The challenges we *all* face across sectors as we strive for a regional economic powerhouse -- skill building, knowledge transfer, talent retention, and ROI -- are interdependent metrics that reflect our mutual success or our mutual decline.

A public-private sector roundtable and fund, facilitated by the Council and supported by higher education institutions, business, and government, for mobilizing and incentivizing new binational partnerships in the Great Lakes can position the region as the place to learn, the place to innovate, the place to work, and the place that can compete and win in the global economy. The time to seize this moment is now!

Add your voice to this effort, or get involved in establishing the roundtable and fund, by contacting the Council of the Great Lakes Region at mark@councilgreatlakesregion.org.

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