

'Brain Drain' in Niagara: Evaluating STEM talent retention through a survey of post-secondary graduates

EXECUTIVE SUMMARY

This report explores the post-graduation experience of recent graduates in Science, Technology, Engineering, and Mathematics (STEM) programs from Brock University and Niagara College. Through a survey, it aims to shed light on talent retention patterns in the Regional Municipality of Niagara. This includes whether graduates are choosing to live and work in the region following graduation, and what factors are influencing their decision. The report finds that while half of graduates continue to live in Niagara, nearly two-thirds are working in jobs outside of the region. Among those currently working outside Niagara, the critical factors in their decision to pursue employment elsewhere were job opportunity, compensation, and the perceived competitiveness of local firms. Graduates agree that more career opportunities, affordable and attainable housing, and connected public transit would help to improve the post-graduation experience of Brock University and Niagara College alumni.

INTRODUCTION

When Brock University and Niagara College opened their doors in the 1960s, they provided an influx of highly skilled labour to the Niagara workforce (Patrias and Savage 2012; Gayler 1994). Graduates helped to bolster regional strengths in manufacturing, agriculture, and tourism, while research institutes and innovation centres provided resources and supports to local businesses. Today, there are approximately 30,000 students enrolled in post-secondary schools in the Niagara region, and the recent opening of the University of Niagara Falls Canada promises another injection of talent into the local labour pool (Niagara College 2023; Brock University 2021).

Over the last 50 years, however, Niagara's regional economy has undergone significant change. New technologies have transformed local firms, and offshoring and automation have changed the types of jobs associated with economic growth within the region (Calcott and Conteh 2018; Conteh 2019; Lemay, Conteh, and Boggs 2021). The result is a burgeoning knowledge economy in which premiums are increasingly placed on creativity and innovation, and in which jobs require higher degrees of post-secondary education than ever before (Dueck and Conteh 2015). In this new economic landscape, the attraction, development, and retention of highly skilled workers are paramount (Cassidy 2015; Dueck and Conteh 2015; Phillips and Durrant 2017).

There is nevertheless concern that Niagara's workforce is not keeping pace with these changes. The region has long trailed the rest of Ontario when it comes to education attainment, with higher percentages of Niagara residents having no certificate, diploma, or degree (Niagara Region 2022; St. Catharines 2017; Niagara Falls 2014; Welland 2004; Cassidy 2015). Niagara also has proportionately fewer young people than the rest of the province, reinforcing the perception that Niagara is for "seniors and tourists"—not young workers and entrepreneurs (Blushak et al. 2009; Phillips and Durrant 2017). While there is some evidence that Niagara's workforce is getting younger and more qualified, buoyed by the attraction of young workers from Toronto, there remains a perceived disconnect between Niagara's workforce and the jobs available (Niagara Region 2022).

The reasons given for this disconnect are diverse. In some cases, students may be staying in school instead of entering the workforce. In others, they may be studying subjects that do not equip them for the types of jobs available in the region (Conteh, Phillips, and Ferguson 2017).

Conversely, employers may not be adapting to the preferences of skilled workers, such as the popularization of remote work, and may be overestimating the skills and education required for certain jobs (Cassidy 2015). Phillips and Durrant (2017) argue that the seasonality of key sectors like agriculture and tourism can make it difficult for graduates to secure competitive and year-round employment, leading many to pursue work elsewhere. Others point to social and cultural disconnects, suggesting that Niagara's "small-town lifestyle" may not appeal to young professionals (Niagara Falls 2014). In this case, the worry is that younger people are leaving the Niagara region to pursue jobs in a "more vibrant living environment" (St. Catharines 2017).

Whatever the reason, this disconnect between Niagara's workforce and its evolving regional economy is cause for concern (Phillips and Durrant 2017). Lower education attainment levels are associated with lower earnings, and a high proportion of Niagara's workforce is working in low-skill and low-wage jobs in sales and services (Niagara Region 2022; Conteh et al. 2017). Skilled labour is also critical to the types of innovation and entrepreneurship associated with economic growth, and graduates from local post-secondary institutions are an important resource for companies hoping to remain competitive on the global stage (Dueck and Conteh 2015).

The question of how to attract, develop, and retain a skilled workforce has therefore been top of mind. As early as 2005, the development of Niagara's talent pool was identified as a key strategic priority for the Regional Municipality of Niagara (Niagara Region), which contains the local area municipalities of Niagara Falls, Port Colborne, St. Catharines, Thorold, Welland, Fort Erie, Grimsby, Lincoln, Niagara-on-the-Lake, Pelham, Wainfleet, and West Lincoln (Niagara Region 2005). A decade later, attracting and retaining a younger, skilled labour force remained a key pillar of the Region's economic plan (Phillips and Durrant 2017). Such ideas now permeate the Region's newest 10-Year economic development strategy, as well, which notes the persistent mismatch between available jobs and the existing workforce (Niagara Region 2022). Niagara's lower-tier municipalities have also expressed their own concerns regarding the region's workforce, as well as interest in improving connections between Niagara's educational institutions and its evolving economy (St. Catharines 2017; Niagara Falls 2014; Welland 2013).

In light of these concerns, this report aims to shed additional light on talent retention patterns in Niagara. Drawing on a survey of recent STEM graduates from Brock University and Niagara College, it asks whether graduates

in these fields are working in the Niagara region following graduation and whether they have found employment related to their studies. It explores the factors influencing students' post-graduation experience, and the changes that alumni feel would make the Niagara region a more attractive place to work and live.

The report finds that while half of graduates continue to live in Niagara, nearly two-thirds are working in jobs outside of the region. Among those currently working outside of Niagara, job opportunities, compensation, and the perceived competitiveness of local firms were critical factors in their decision to pursue employment elsewhere. Graduates agree that more career opportunities, affordable and attainable housing, and connected public transit would help to improve the post-graduation experience of Brock University and Niagara College alumni.

RESEARCH METHOD

In collaboration with the Brock University Alumni Office and Niagara College Alumni Office, researchers for this project conducted a survey of students from select science, technology, engineering, and mathematics (STEM) programs offered by each institution. A list of programs was generated using records from the Brock University Registrar and the Niagara College website, and is provided in **Appendix A**. All those who graduated from these programs between 2004 and 2022 were emailed an invitation to complete the survey. This time frame is recent enough to provide relevant insights while still ensuring that graduates have had time to pursue and settle into prospective careers.

Data collection was completed between October 2023 and April 2024. A total of 3,854 alumni were invited to complete the survey: 2,344 from Brock University and 1,510 from Niagara College. Of these, 92 Brock University alumni and 37 Niagara College alumni completed the survey, while 13 others (12 from Brock University and one from Niagara College) began the survey but did not complete it. This makes for an overall participation rate of 3.35 per cent, with the participation rate being slightly higher among Brock University alumni than those from Niagara College.

The survey asked participants to identify their school and program and posed several questions about each students' post-graduation experience. This included questions regarding whether they had chosen to live and work in the Niagara region following graduation, and where they had elected to work if they are working outside Niagara. Participants were also asked about the sector in which they work, and whether they had been able to find work

related to their field of study. Students were then asked to identify the factors that were most influential to their decision to work in Niagara or not, and to provide feedback on what they felt could be done to make the region a more attractive place to live and work for graduates in their respective fields.

FINDINGS & ANALYSIS

Demographics

The distribution of participants by year of graduation is provided in **Figure 1**. Brock University graduates tended to congregate bimodally between the early 2000s (2006–2009) and the last six years (2016–2022). The two most common graduating years for Brock University alumni were 2020 (10.9 per cent) and 2022 (9.9 per cent). By contrast, the majority of Niagara College alumni graduated in 2012 or later. Over one-fifth (21.1 per cent) of participants from Niagara College graduated in 2019, and another 15.8 per cent graduated in 2020. There were very few Niagara College graduates from the early 2000s.

Over half (53.9 per cent) of participants reported being between 20 and 34 years old (**Figure 2**). Another 34.3 per cent were between 35 and 44 years old. Over half of respondents (51.6 per cent) identified as male, while 42.2 per cent identified as female. A higher proportion of Niagara College graduates were both older and male compared to graduates from Brock University.

Over one-tenth (14.8 per cent) of respondents identified as racialized, and 8.6 per cent identified as having a disability. Notably, those identifying as Indigenous (0.8 per cent) were underrepresented in the survey sample.

Figure 2: Survey Participants by Age

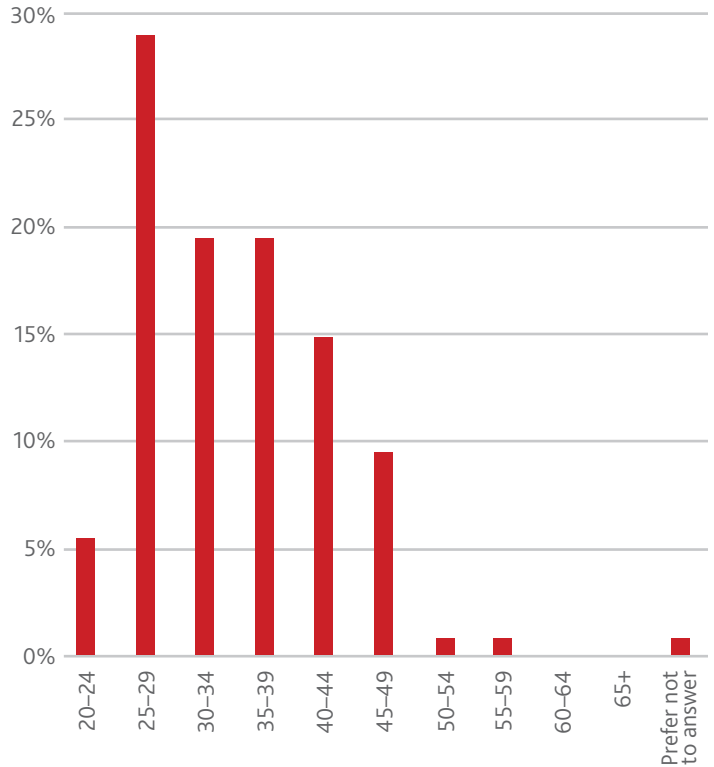


Figure 1: Distribution of Graduates by Graduating Year

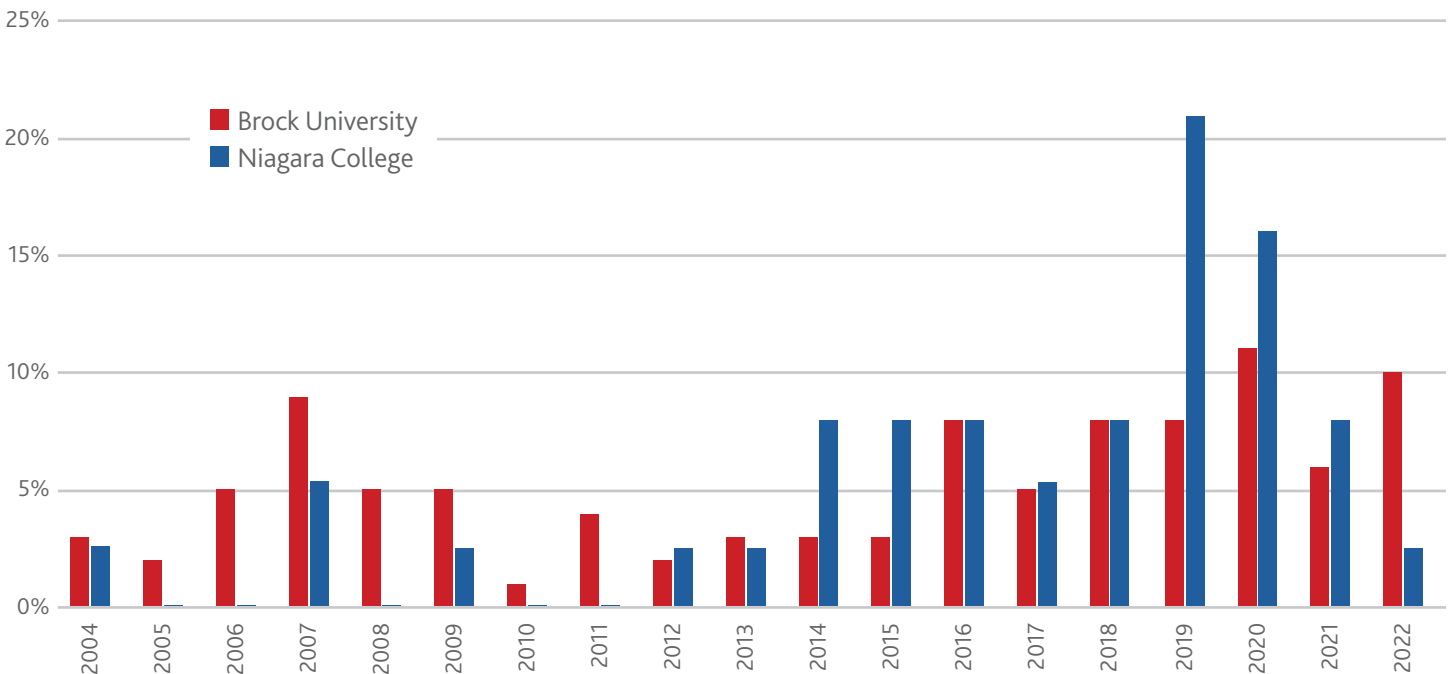
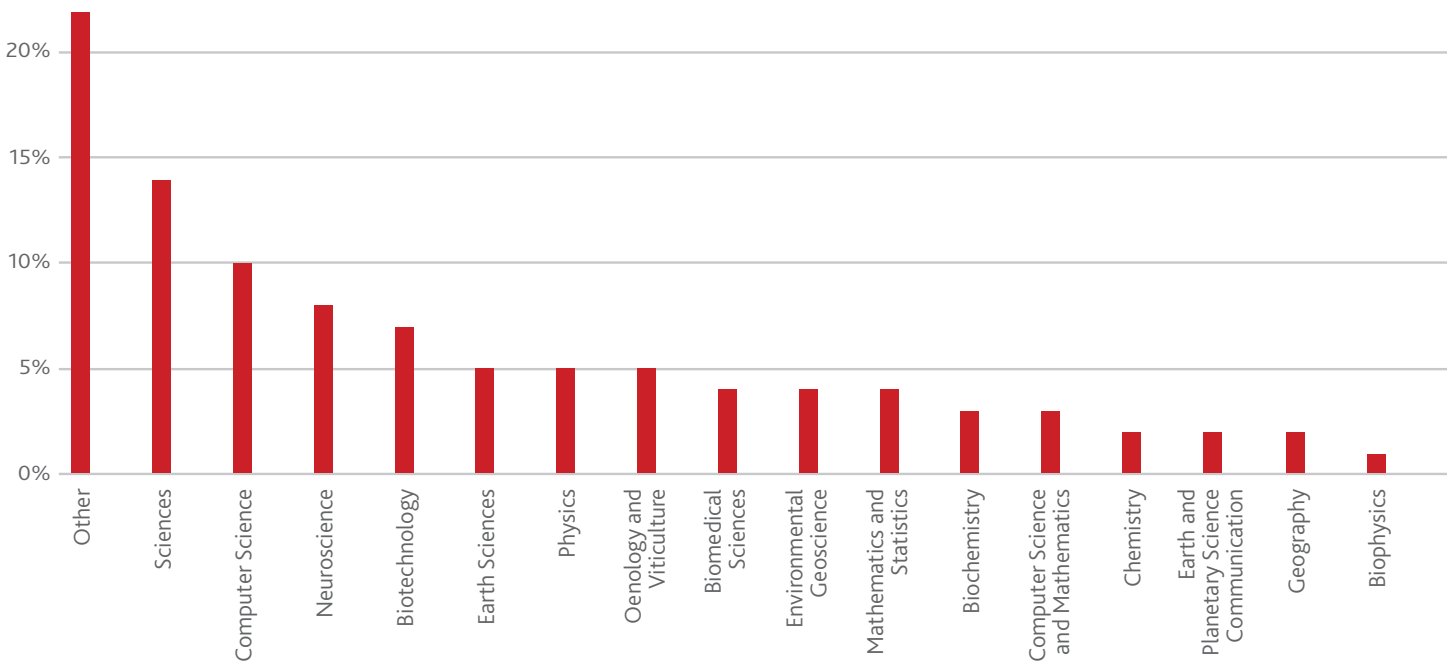


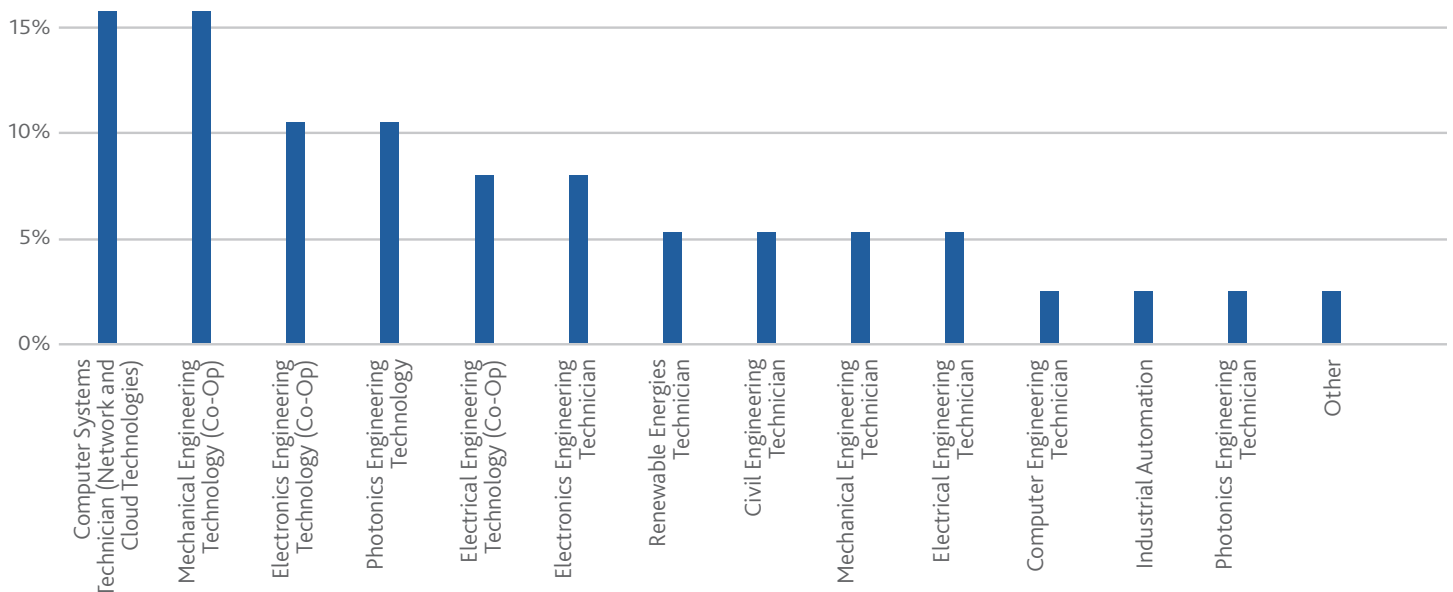
Figure 3: Program Distribution of Brock University Graduates



Among Brock University graduates, the top two programs represented in the survey were Sciences (13.9 per cent) and Computer Science (9.9 per cent) (**Figure 3**). Neuroscience (7.9 per cent) and Biotechnology (6.9 per cent) were also popular. Over one-fifth (21.8 per cent) of Brock University graduates indicated that they completed a different program than those listed on the survey, with biological science and consecutive education (under 'other') being the most common.

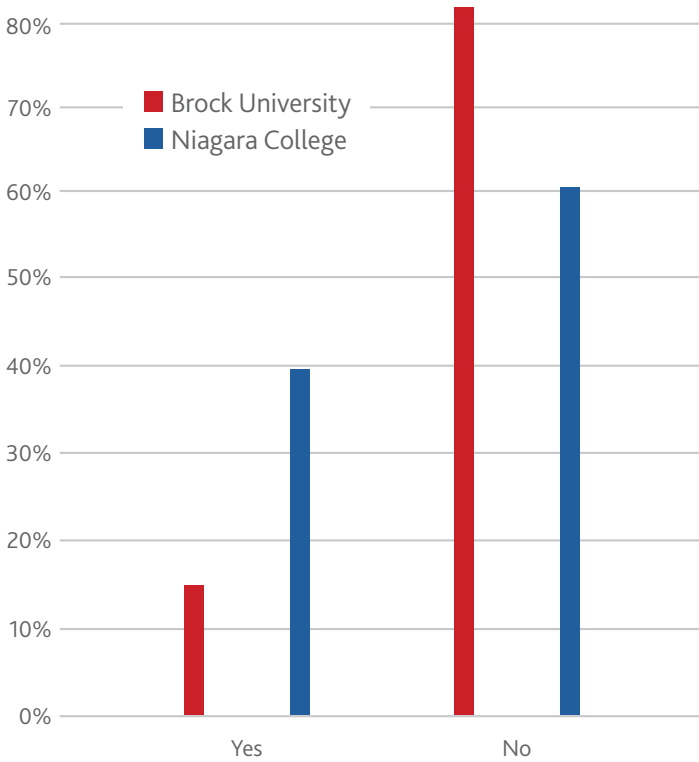
The most common programs among Niagara College graduates were Computer Systems Technician (15.8 per cent), Mechanical Engineering Technology (15.8 per cent), Electronics Engineering Technology: Co-Op (10.5 per cent) and Photonics Engineering Technology (10.5 per cent) (**Figure 4**). Electrical Engineering Technology: Co-Op (7.9 per cent) and Electronics Engineering Technician (7.9 per cent) were also popular.

Figure 4: Program Distribution of Niagara College Graduates



There were notable differences in Co-op participation between graduates from Brock University and Niagara College (Figure 5). While 39.5 per cent of Niagara College alumni said they participated in a Co-op placement as part of their program, only 14.9 per cent of Brock University graduates said they had participated in a Co-op placement. In part, this may reflect the different mandates and pedagogies of the two institutions.

Figure 5: Co-Op Participation Among Post-Secondary Graduates

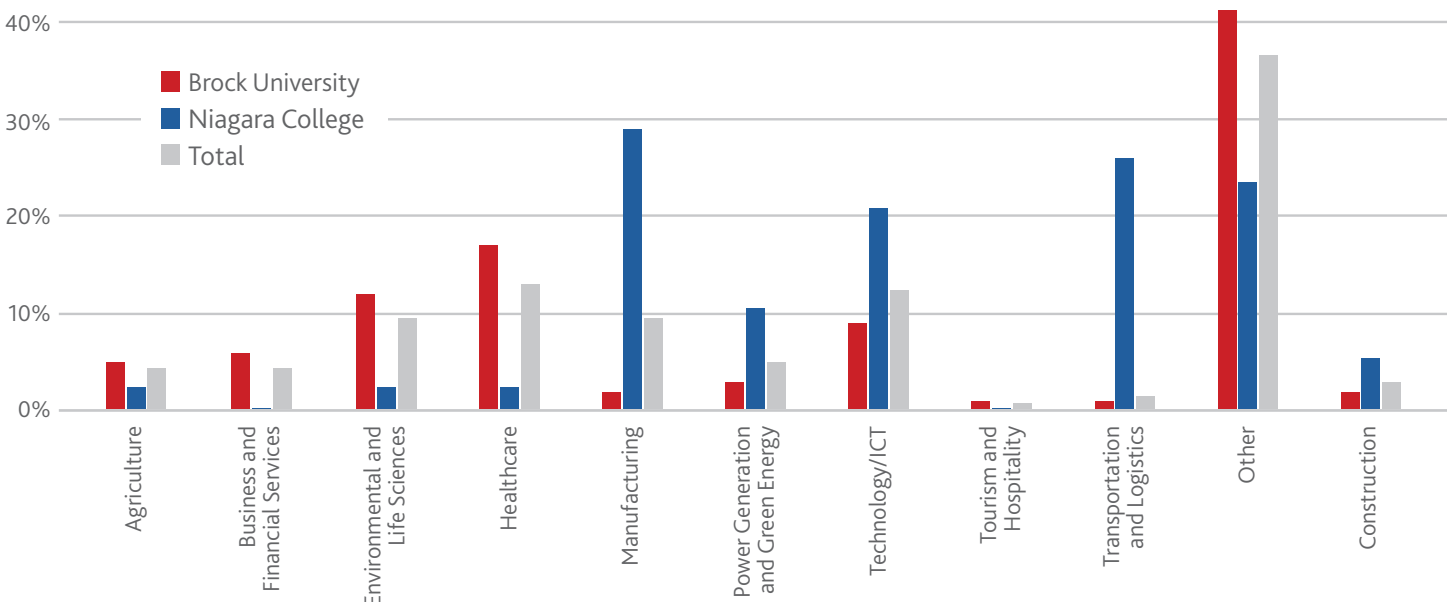


When asked in what sector they are currently working, the most popular selections among participants were health care (13.1 per cent) and technology/ICT (12.4 per cent) (Figure 6). Environmental and life sciences (9.5 per cent) and manufacturing (9.5 per cent) were also common. Alumni from Niagara College were much more likely than Brock University graduates to be working in manufacturing (28.9 per cent versus 2.0 per cent), transportation and logistics (36.0 per cent versus 1.0 per cent), and technology/ICT (21.1 per cent versus 9.1 per cent). Brock University graduates, by contrast, were more likely to be working in health care (17.2 per cent versus 2.6 per cent) and the environmental and life sciences (12.1 per cent versus 2.6 per cent). Only 2.8 per cent of respondents reported being unemployed.

Over one-third of participants (36.5 per cent) reported working in a sector other than the options listed. On the one hand, the number of respondents who selected 'other' is concerning. Many of the options provided on the survey, such as manufacturing, agriculture, and tourism/hospitality, correspond with critical sectors in Niagara's regional economy. Niagara Region's newest economic development strategy, for instance, identifies these three areas as key strategic sectors for the next 10 years, and it is concerning to think that local graduates are not finding employment in them (Niagara Region 2022).

However, these concerns should be partially mitigated by some of the definitional challenges that characterize Niagara's dominant economic sectors. For instance, someone working in the wine industry may select 'other' rather than agriculture or manufacturing, while those working in the oil and gas industry appeared reluctant

Figure 6: Employment by Sector



to select power generation and green energy as their employment sector. Many of those who selected 'other' (14.1 per cent) also reported that they are working in academia and/or education, including the pursuit of graduate studies.

Income distribution was relatively similar between Brock University and Niagara College respondents (Figure 7). Brock University graduates were more likely than Niagara College alumni to be making \$150,000 or more (9.9 per cent versus 2.9 per cent). Niagara College graduates, however, were more likely to be making between \$100,000 and \$149,000 per year (22.9 per cent versus 13.2 per cent). Given the relatively low response rate to the survey, it is difficult to draw useful comparisons across programs, sectors, or other demographics.

The Post-Graduation Experience of Niagara Alumni

Before exploring the post-graduation experience of recent graduates, it is important to clarify where students are coming from to attend post-secondary school in Niagara. Brock University respondents were evenly divided between those who lived in the Niagara region prior to attending

post-secondary school and those who moved to the region to begin their studies. Niagara College respondents, on the other hand, were more likely to have lived in the region prior to attending post-secondary school (52.6 per cent) compared to Brock University respondents (44.7 per cent). Of those who lived in Niagara prior to attending post-secondary school, the vast majority reported living in the region for 15 years or longer. Niagara College graduates were more likely to have attended their program as an international student (23.7 per cent) than Brock University alumni (9.9 per cent).

The survey asked graduates where they were working as well as where they were living. Slightly more than half (55.5 per cent) of participants said they were now living outside the Niagara region. The divide was more significant when asked where they were working. Nearly two-thirds (61.3 per cent) of participants said they were now working outside of Niagara. Graduates from Brock University (62.6 per cent) were slightly more likely to report working outside of Niagara than graduates from Niagara College (57.9 per cent). Among those working outside of the Niagara region, most (91.7 per cent) reported working elsewhere in Canada. **Both schools are thus experiencing a net loss when it comes to talent retention.**

Figure 7: Income Distribution of Recent Graduates by Institution

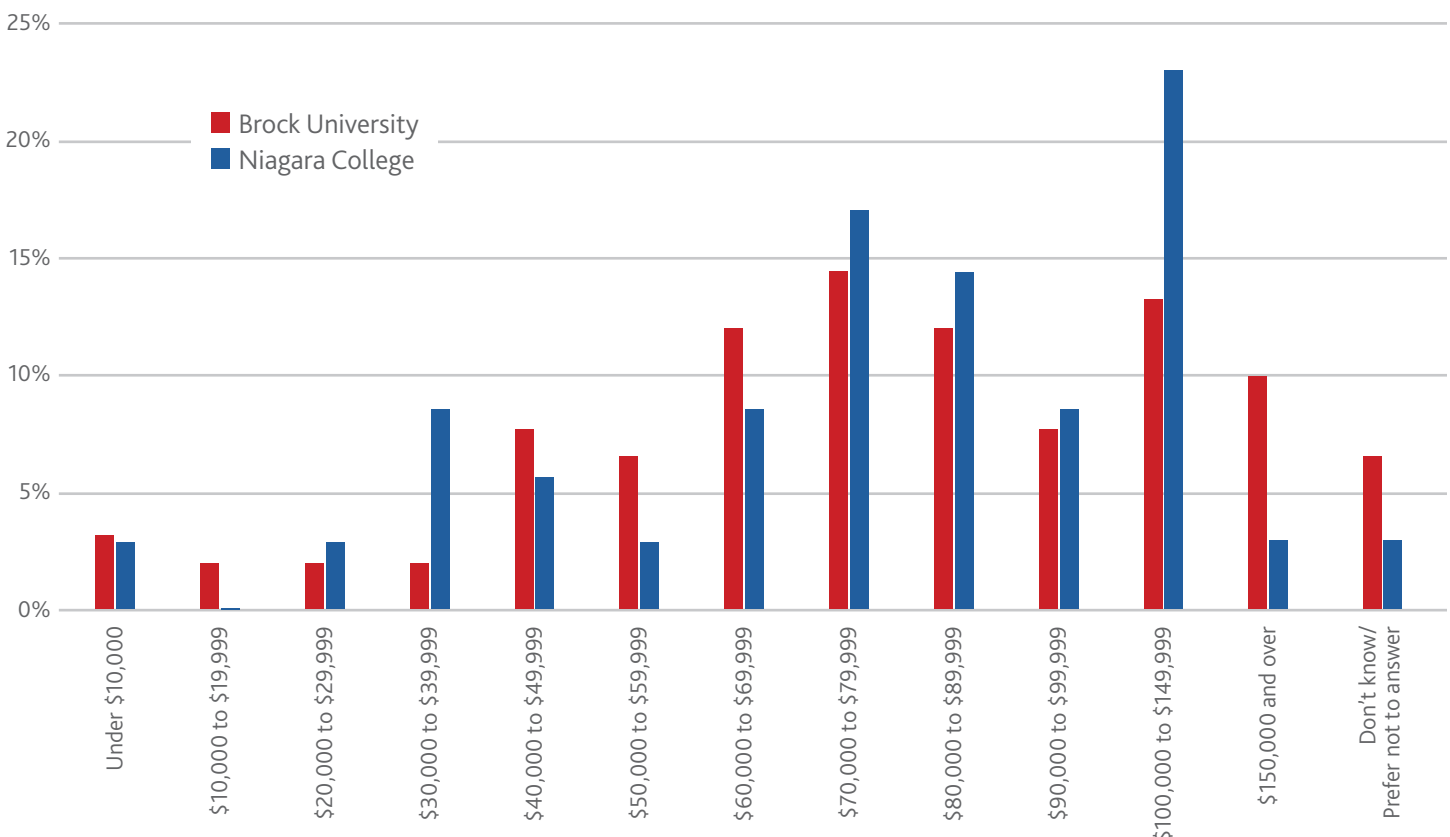


Figure 8: Current Workplace by Institution

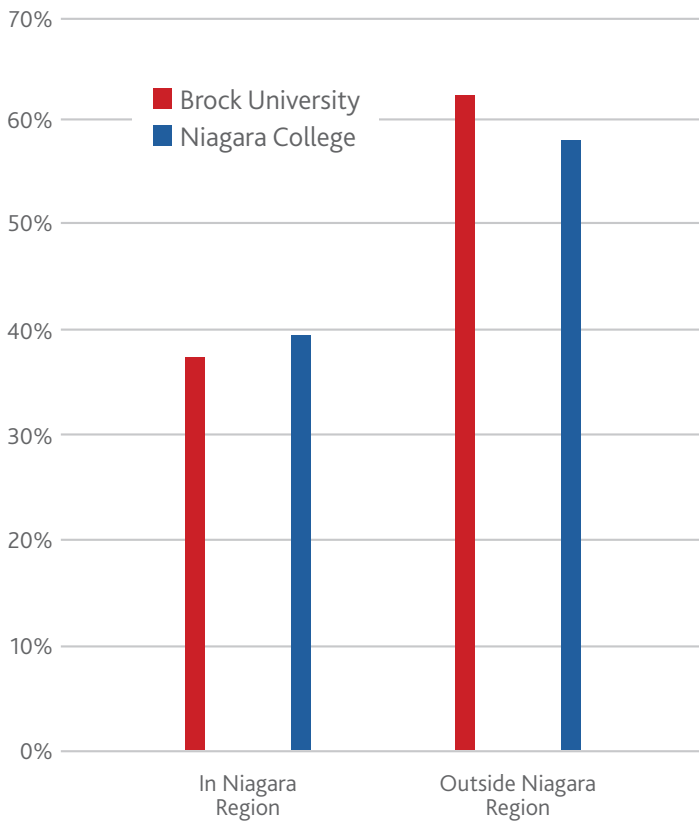
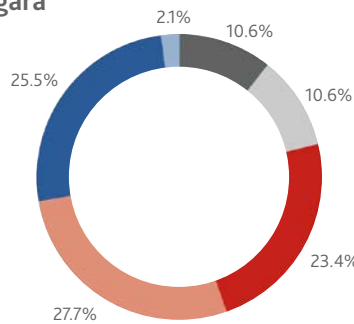


Figure 9: Responses to the statement: It was important to me to stay in Niagara following graduation.

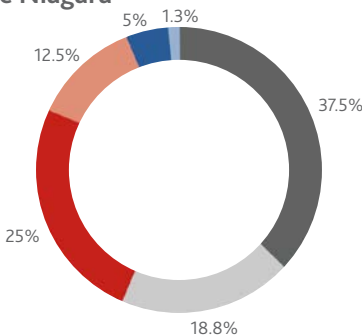
Respondents working in Niagara

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree
- Don't know/ Prefer not to answer



Respondents working outside Niagara

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree
- Don't know/ Prefer not to answer



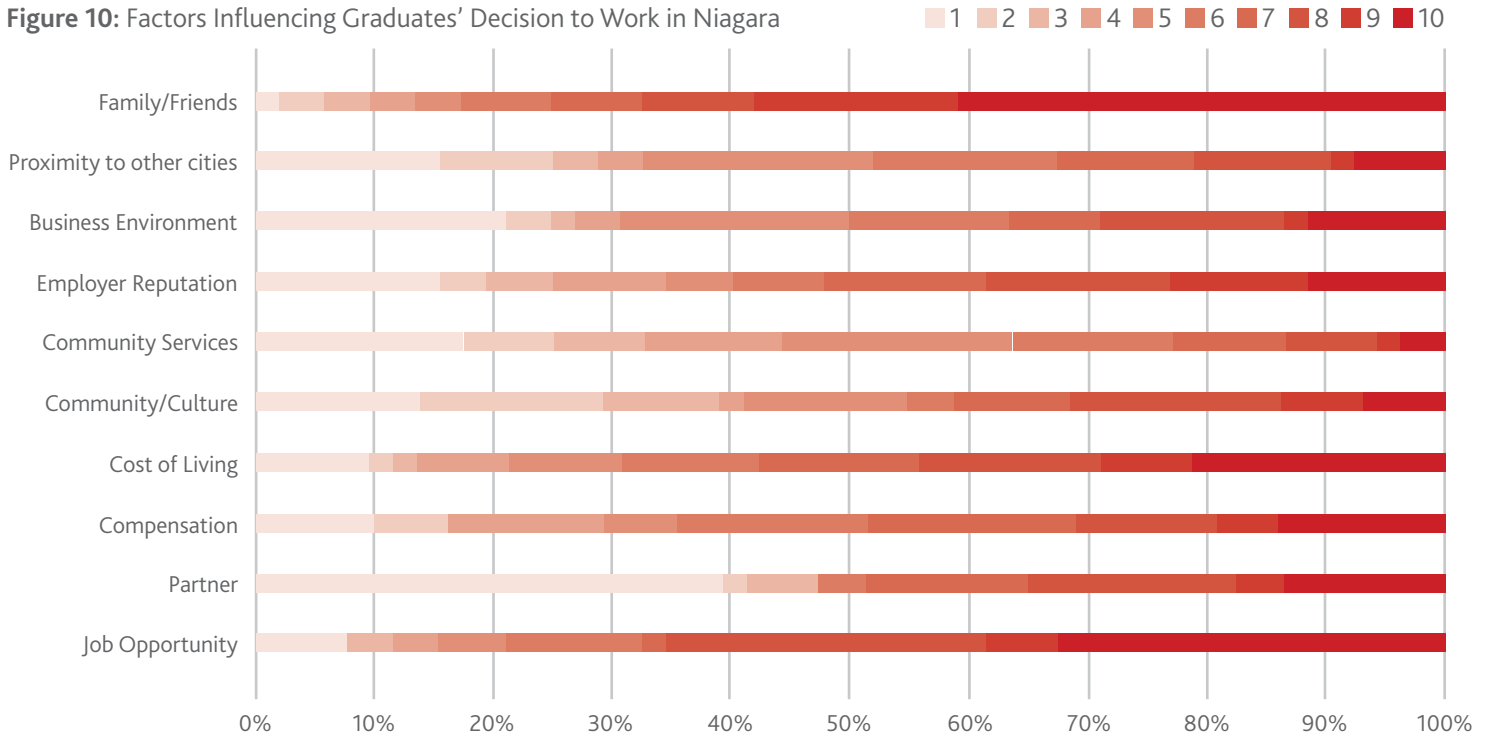
Whereas 44.7 per cent of Brock University students lived in the Niagara region before attending post-secondary school, only 37.4 per cent are working in the region following graduation—a difference of 7.3 per cent. While 52.6 per cent of Niagara College graduates lived in Niagara before attending post-secondary school, only 42.1 per cent are working in the region following graduation—a difference of 10.5 per cent.

When asked if they felt it was important to stay in Niagara following graduation, more than half of those currently working in Niagara (53.2 per cent) agreed that it was. About one quarter of those working in Niagara (25.5 per cent) 'strongly agreed' that they felt it was important to stay in the region following graduation. Conversely, fewer than half (37.5 per cent) of those currently working outside of the Niagara region 'agreed' it was important that they stay in the region following graduation, with just 12.5 per cent saying they 'strongly agreed'. Over one third (37.5 per cent) said they 'strongly' disagreed that it was important for them to stay in the region after the completion of their program.

Respondents were then asked to rate the importance of various factors to their decision to work in or outside of the Niagara region. The responses of those working in Niagara are recounted in **Figure 10**. Connections to family and friends, job opportunity, and cost of living were rated most influential (the darker the bar, the more important/highly ranked of a factor). Others mentioned funding and support for businesses, partners' career commitments, and Niagara's unique blend of urban and rural environments as reasons for their decision to work in Niagara. One respondent wrote that "the cost of pursuing opportunities in other cities is too high," suggesting that there are barriers to emigration even for those who might wish to leave.

For those working outside of Niagara, by contrast, job opportunity was far and away the most important factor influencing their decision (**Figure 11**). Compensation and employer reputation were also rated as highly important (the darker the bar, the more important/highly ranked of a factor). When asked to provide further insight into the factors that influenced their decision, many mentioned a lack of job opportunities available to them following graduation—particularly within STEM-related fields. Many also mentioned a rising cost of living and increased housing prices as critical factors. For others, the reasons were more qualitative and experiential. "Niagara region has very little culture for younger people," wrote one respondent. "It is a place to retire to."

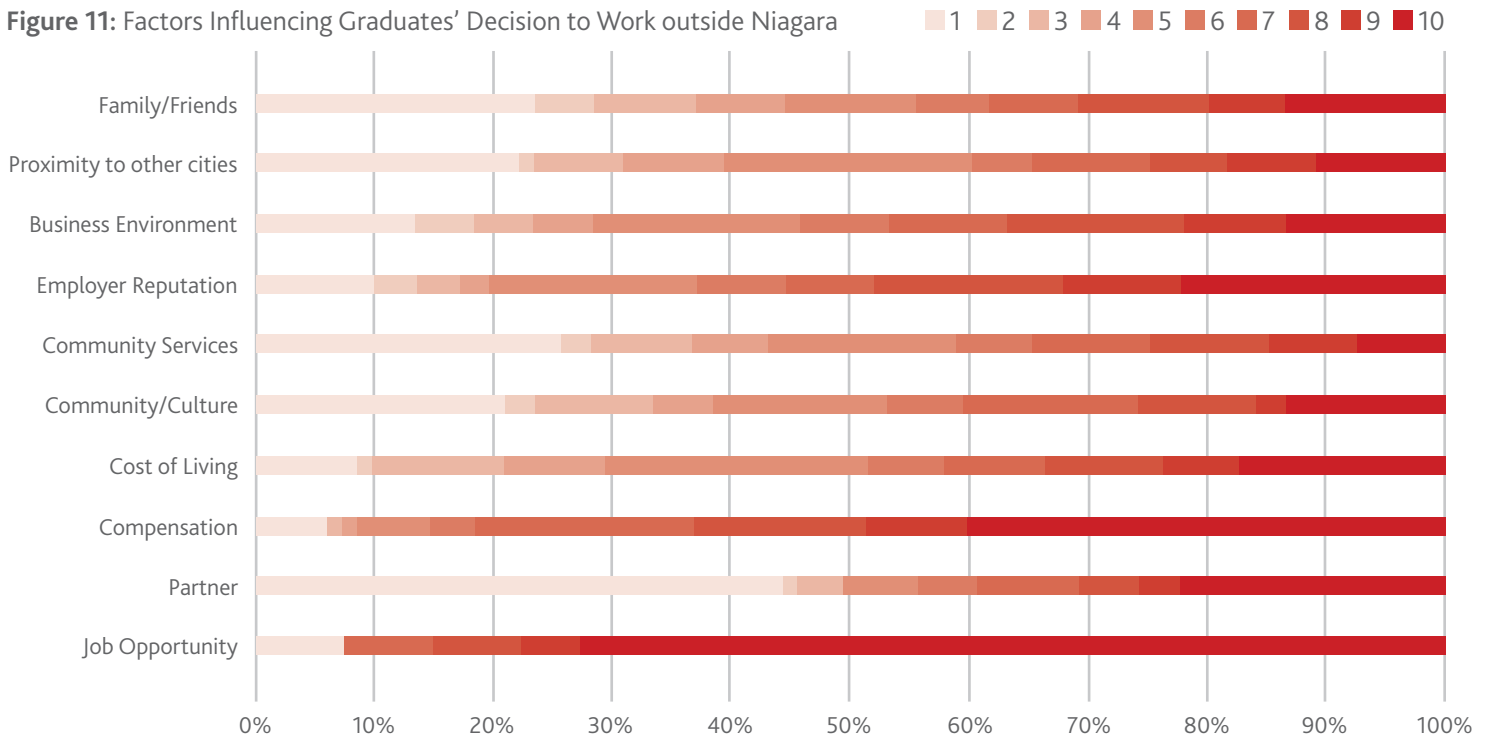
Figure 10: Factors Influencing Graduates' Decision to Work in Niagara



In short, nearly two-thirds of graduates are working outside of the Niagara region upon graduation. Graduates from Brock University were slightly more likely to do so than graduates from Niagara College. This represents a net-loss

of graduates when considering how many lived in the Niagara region prior to their post-secondary studies. Of those who are working outside of the region, job opportunity and compensation appear to be driving factors in their decision.

Figure 11: Factors Influencing Graduates' Decision to Work outside Niagara

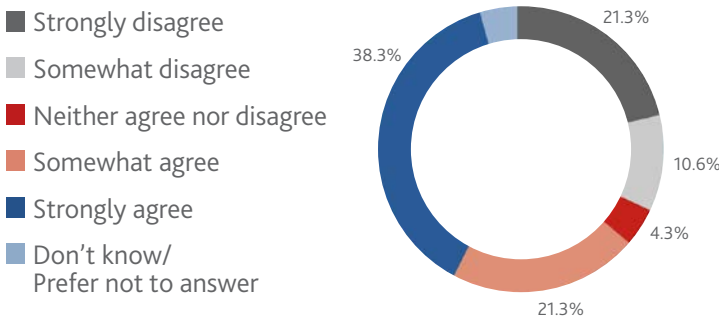


Workforce Perception Among Recent Graduates

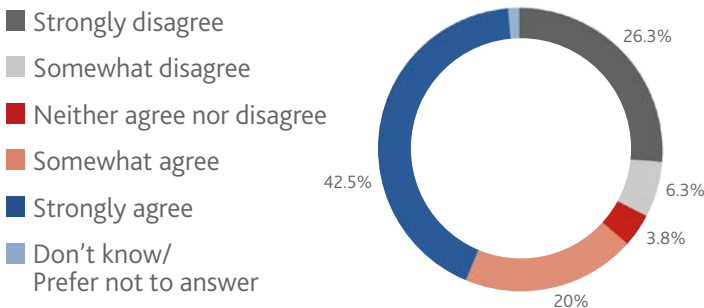
The remaining survey questions shed further light on graduates' post-graduation experience, comparing those working in Niagara to those working outside the region. When asked whether they agreed that they were able to find a job in their field following graduation, for instance, over half of those working in Niagara (59.6 per cent) said they 'agree' (**Figure 12**) and more than one third (38.3 per cent) said they 'strongly agree'. Those working outside of Niagara were slightly more optimistic about their ability to find a job in their field following graduation. Of those working outside the region, 62.5 per cent said the 'agree' that they were able to find a job in their field, with 42.5 per cent saying they 'strongly agree.'

Figure 12: Responses to the statement: I was able to find a job in my field following graduation.

Respondents working in Niagara



Respondents working outside Niagara

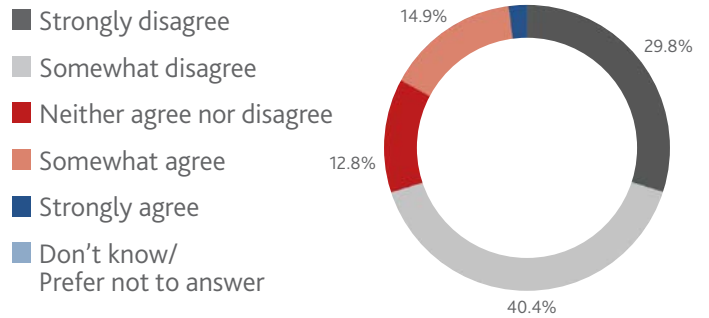


Participants were more pessimistic when asked whether there were a lot of job opportunities in their field within Niagara (**Figure 13**). Even among those currently working in Niagara, only 17 per cent agreed that there were a lot of job opportunities in their field within the region. About 70 per cent of those currently working in Niagara (70.2 per cent) disagreed with the suggestion that there were a lot of local opportunities in their

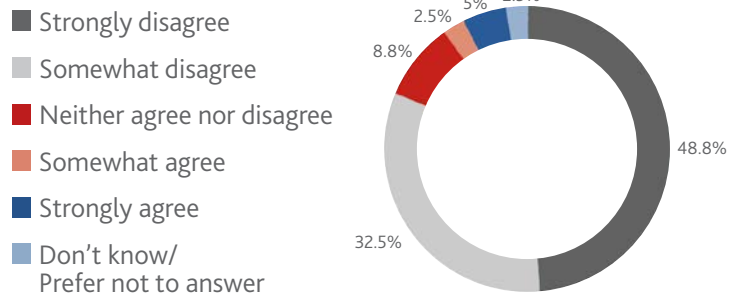
field, with 29.8 per cent saying they 'strongly' disagree. Those working outside Niagara were even more critical. Nearly half (48.8 per cent) of those currently working outside Niagara strongly disagreed with the suggestion that there were a lot of job opportunities in their field within the region, with another 32.5 per cent saying they 'somewhat disagree.' Only 7.5 per cent of those currently working outside Niagara felt there were a lot of job opportunities in their field available in the region.

Figure 13: Responses to the statement: There were a lot of job opportunities in my field within Niagara.

Respondents working in Niagara



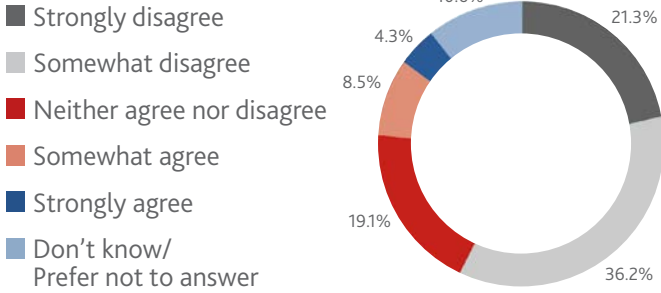
Respondents working outside Niagara



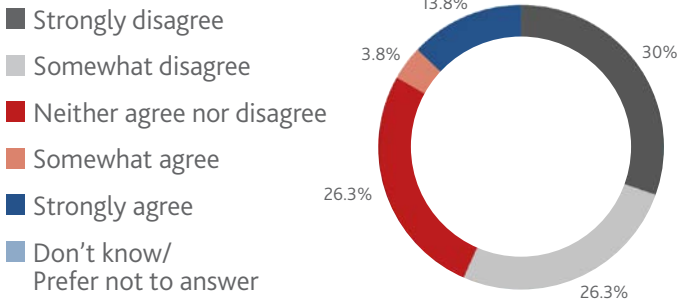
Both those working in Niagara and those working elsewhere disagreed with the suggestion that Niagara employers in their field pay well compared to employers in other places (**Figure 14**). Over half (57.5 per cent) of those currently working in Niagara said they disagree that Niagara employers pay well, compared to 56.3 per cent of those who currently work outside the region. Only 3.8 per cent of those currently working outside Niagara agreed with the suggestion that pay in their field in Niagara is competitive, and nobody who works outside of Niagara said they 'strongly agree.' Graduates currently working in Niagara were slightly more positive, with 12.8 per cent agreeing that Niagara employers in their field pay well.

Figure 14: Responses to the statement: Niagara firms pay well compared to firms in other places.

Respondents working in Niagara



Respondents working outside Niagara



This is reflected in the distribution of incomes among survey participants. Those working outside of Niagara were more likely to be making \$90,000 or higher compared to those working in Niagara and twice as likely to be making more than \$150,000 (10 per cent vs. 4.4 per cent). Those working in Niagara, on the other hand, were much more likely to be making less than \$50,000 (26.7 per cent versus 14 per cent).

Those working in Niagara were slightly more optimistic regarding the competitiveness of Niagara employers compared to those currently working outside of Niagara. When asked whether Niagara employers are competitive in their field, nearly one third (29.8 per cent) of those working in Niagara agreed that they are. This compares to just 12.5 per cent of those currently working outside the region. Conversely, those working outside of Niagara were more than twice as likely as those working in the region to say they 'strongly' disagree with the suggestion that Niagara employers are competitive in their field (35 per cent versus 14.9 per cent).

Graduates were particularly critical when asked if they view the Niagara region as a hub for innovation. Among those currently working in the Niagara region, nearly half (48.9 per cent) said they disagree with the

Figure 15: Distribution of Income by Work Location

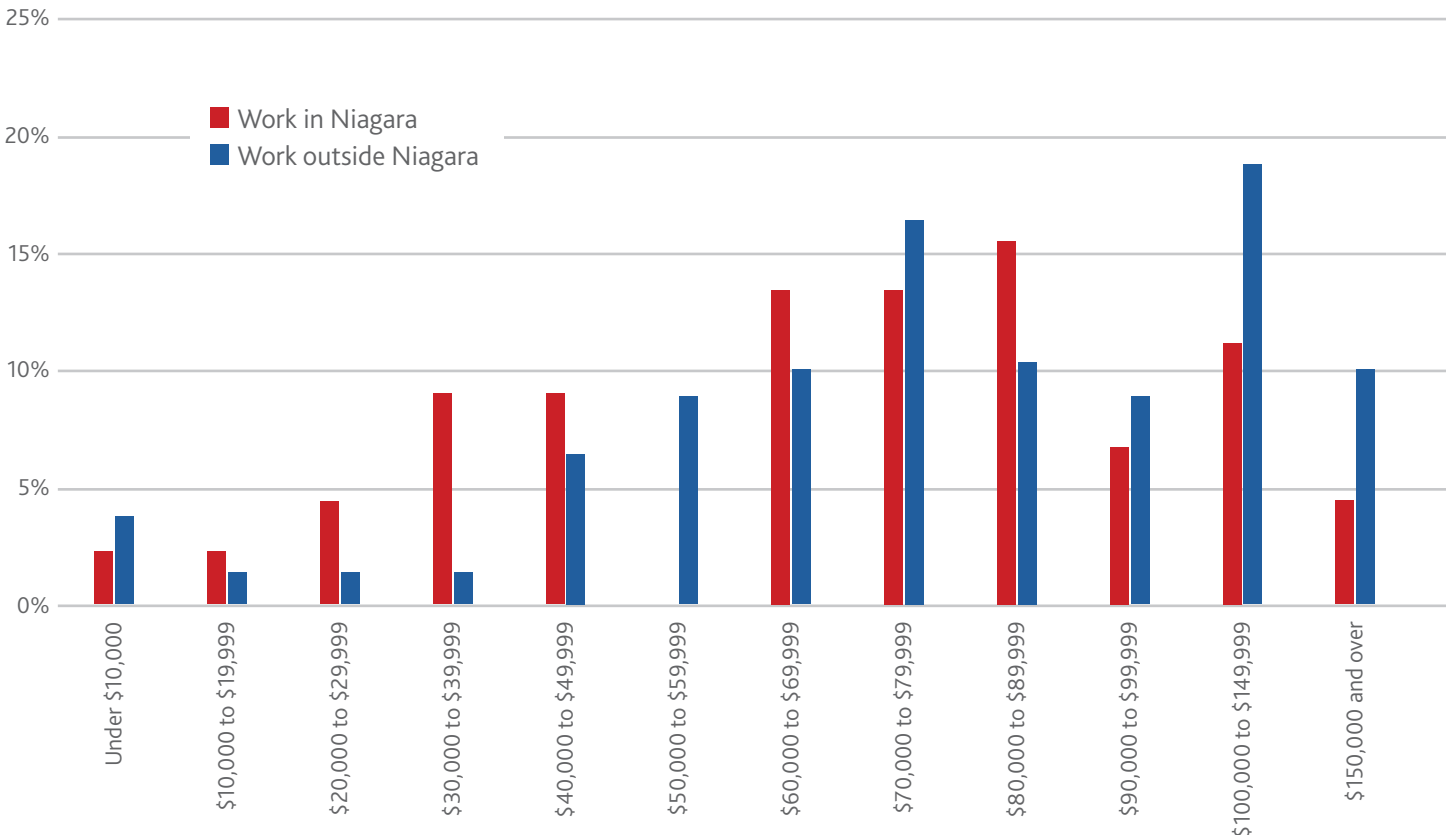
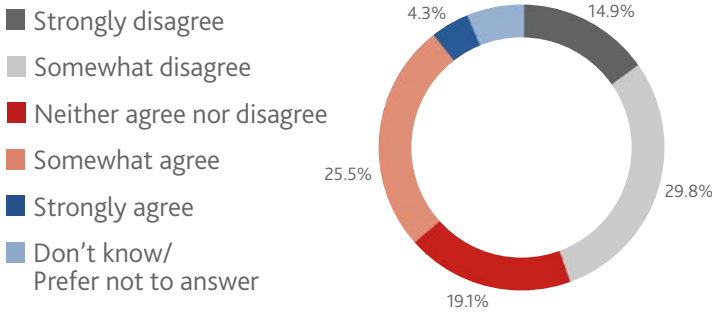
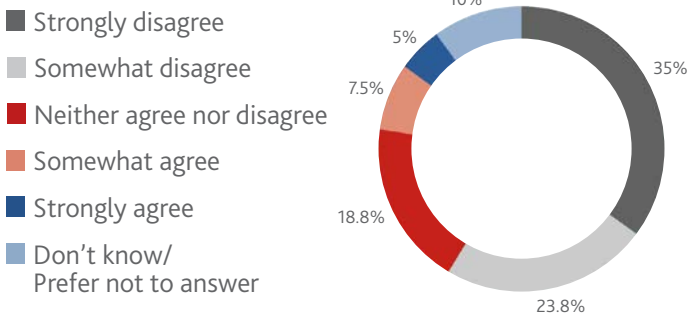


Figure 16: Responses to the statement: Niagara firms are competitive in my field.

Respondents working in Niagara



Respondents working outside Niagara



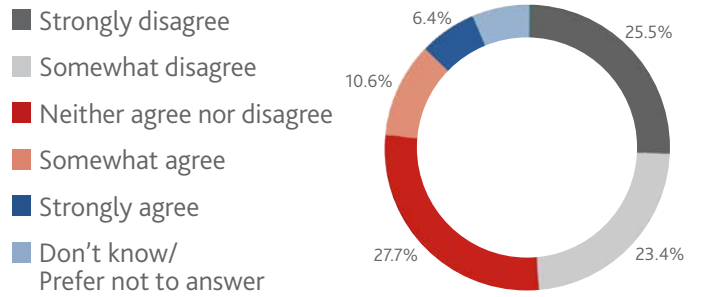
suggestion that Niagara is a hub for innovation in their field. Another 27.7 per cent said they neither agree nor disagree, while only 17 per cent felt that the region is an innovation hub.

Those currently working outside of the Niagara region were even more negative in their assessment. More than three-quarters of graduates working outside of the region (76.2 per cent) disagreed with the suggestion that Niagara is a hub for innovation in their field. More than half of graduates working outside of the region said they 'strongly' disagreed. Only 6.3 per cent of those working outside of the Niagara region said they agreed that Niagara is a hub for innovation in their field.

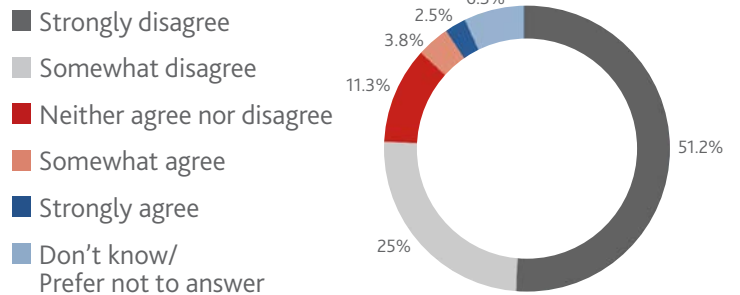
This section explored the perception of Niagara's regional economy by recent graduates. While many said they were able to find work in their field following graduation, most were nevertheless critical of the perceived job opportunities available in the region. Many were also critical of the competitiveness of Niagara firms, and few perceived Niagara to be a hub for innovation in their field. Lastly, graduates disagreed with the suggestion that Niagara firms in their field pay well compared to other jurisdictions, and those working outside of the region appear to be making more money than those working in Niagara.

Figure 17: Responses to the statement: Niagara is a hub for innovation.

Respondents working in Niagara



Respondents working outside Niagara



Perceptions of Quality of Life in Niagara Among Recent Graduates

In addition to providing feedback on employment prospects in Niagara, participants were asked to give their opinions on the cost and quality of life in the region. Among those currently working in Niagara, over half (51.1 per cent) agreed with the suggestion that the cost of living in Niagara is better compared to other places. Only 27.7 per cent said they disagreed. Interestingly, those currently working outside of the Niagara region were even more positive, with 55.1 per cent saying they agree that the cost of living in Niagara is better compared to other places. About one fifth (21.3 per cent) of those currently working outside Niagara said they 'strongly agree.'

Opinions were more mixed when it came to the Niagara region as a place to start a career. Among those currently working in the region, 44.7 per cent said they agree that Niagara is a good place to start a career in their field. This compares to just 15.1 per cent of those who currently work outside of the Niagara region. Of those currently working outside of the region, one third (33.8 per cent) said they 'strongly' disagree that Niagara is a good place to start a career (compared to just 12.8 per cent of those currently working in the region).

Figure 18: Responses to the statement: The cost of living in Niagara is better compared to other places.

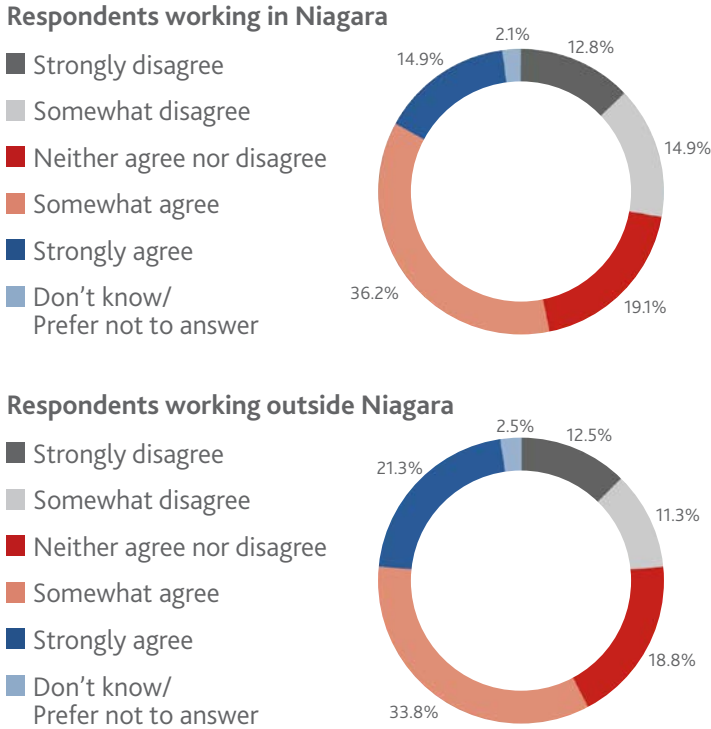
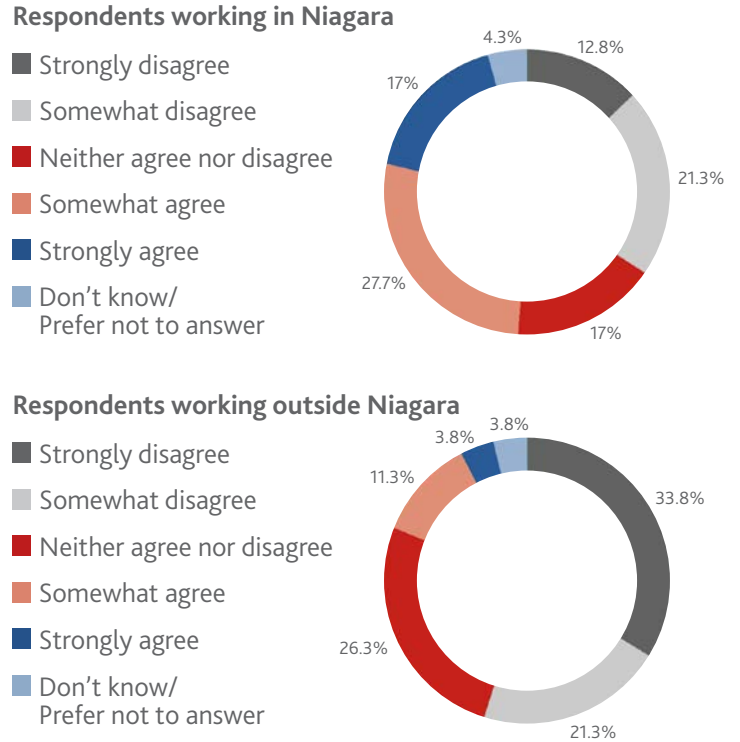


Figure 19: Responses to the statement: Niagara is a good place to start a career.



Yet even those currently working outside of Niagara were positive when asked if the region is an attractive place to live. Nearly three-quarters (72.5 per cent) of those currently working outside of the region said they agree that Niagara is an attractive place to live, while just 17.5 per cent said they disagree. Among those currently working in Niagara, 78.8 per cent said they agree that Niagara is an attractive place to live, with 42.6 per cent saying that they 'strongly agree.'

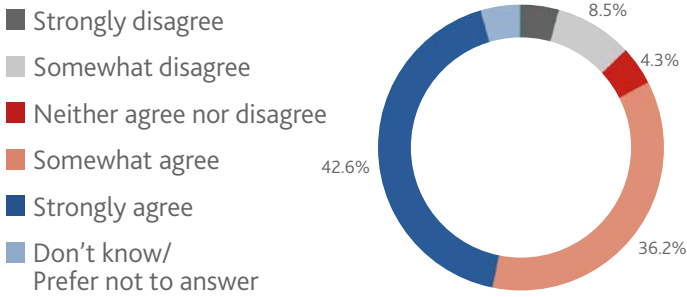
Lastly, graduates were asked what they felt could be done to make Niagara a more attractive place to work. The most common suggestion by far was the need for more competitive job opportunities within Niagara. One participant wrote that "a large base of good-paying manufacturing jobs cannot be replaced with lower-paying service sector jobs," while another suggested that "there is very little industry in the area to support the constant flow of highly educated individuals exiting Brock and other institutions, especially in science industries." Some suggested that the focus on tourism and hospitality related industries is detracting from opportunities more relevant to their field of study, while many argued that existing jobs could be made more competitive by increased wages.

The second most common response among graduates was the need for better and more affordable housing options in the Niagara region. Though there was agreement that Niagara is an attractive place to live, graduates mentioned a lack of safe and modern rentals, overpriced family homes, and a growing homelessness crisis as key challenges within the region. "I find Niagara an attractive place to work," said one participant. "It is just the cost of living." Another wrote that "\$650,000 for a two-bedroom is robbery," hinting at rising housing costs across the Niagara Peninsula. This perception among graduates is notable insofar as housing prices in Niagara remain relatively cheaper than housing costs in nearby cities like Hamilton or Toronto, and respondents continue to feel that the cost of living in Niagara is better compared to other places. Reasons for this apparent disconnect are explored in more detail below.

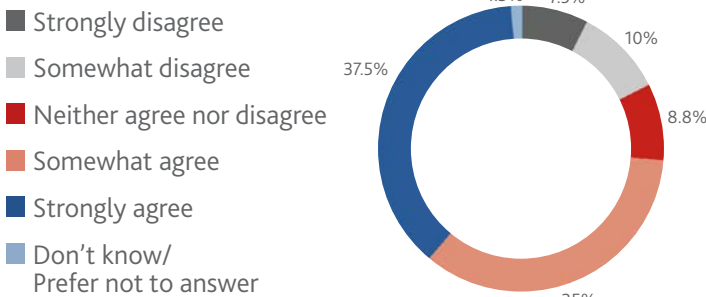
A third notable factor that graduates mentioned was the need for better and more connected public transit across the Niagara region. Graduates pointed to limited hours, inaccessible routes, and slow service as critical barriers to opportunity within the region and argued that addressing these challenges could help make Niagara a more attractive place to work. One participant wrote, "post-graduation I couldn't afford a car so I likely wouldn't have been able to get [to] a job in Niagara even if I'd gotten one."

Figure 20: Responses to the statement: Niagara is an attractive place to live.

Respondents working in Niagara



Respondents working outside Niagara



While these comments shed light on the post-graduation challenges created by a lack of public transit, this lack of effective service can also create challenges during post-secondary studies. Gervais et al. (2020) have found, for instance, that a lack of public transit makes it difficult for students in Niagara to experience, and plant roots within, the community, further limiting incentive to stay following graduation. Students are limited to life on campus and at home, with little opportunity to experience all that Niagara has to offer. It is interesting, in this regard, that several students mentioned a lack of nightlife, cultural development, and community events as another barrier preventing Niagara from being a more attractive place to work. It is possible—if not likely—that what cultural programming is available in Niagara remains inaccessible to students without effective public transit.

Concerningly, some graduates mentioned racism and discrimination as barriers to making Niagara a more attractive place to work. One respondent wrote that “big employers need to be more open-minded and give equal chance of employment to immigrants.” Another wrote that “less racism in the community” would make Niagara a more attractive place to work. Though it is difficult to evaluate each of these experiences in detail, the fact that

several students felt that this was a barrier to working in Niagara suggests the need for further and more dedicated research regarding the experience of visible minority graduates within the Niagara region. From a purely economic standpoint, extant literature extols the virtues of regions with greater demographic diversity as being positively correlated with higher creativity, dynamism, and resilience (Wolfe and Gertler 2016).

In sum, Niagara’s quality of life is viewed positively by recent post-secondary graduates, and the region continues to be regarded as an attractive place to live. Fewer graduates felt that Niagara is a good place to start a career, however. When asked what could be done to make working in the Niagara region more attractive, respondents mentioned the need for more job opportunities, more affordable housing, and better public transit.

DISCUSSION

Post-secondary institutions function as important export industries with their respective communities, attracting external capital in the form of students then generating positive impacts through development of the workforce leading to wage increases, knowledge transfer, innovation, and more. Central to this potential is the idea that many students attending a post-secondary institution will find work in the community following graduation, or even start businesses of their own. It is also important that universities and colleges provide programming relevant to the strengths and opportunities that are available within the local economy, and that they leverage things like co-ops and research partnerships to connect students with local employers. Conversely, the outflow of graduates can undermine the contribution of post-secondary institutions to local economic development by decreasing the local supply of skilled workers (Bartik and Erickcek 2007).

Given the importance of post-secondary graduates to economic growth and the broader socioeconomic prosperity of the community, it is unsurprising to find policymakers in Niagara concerned about the region’s talent development and retention landscape. These local concerns reflect broader conversations about Canada’s so-called ‘brain drain,’ and the emigration of high-end talent to opportunities outside of the country. Spicer, Olmstead, and Goodman (2018) find, for instance, that a quarter of Canadian STEM graduates are opting to work outside of Canada. The proportion of students leaving is even higher in fields like software engineering, where nearly 66 per cent of students are leaving Canada for work after graduation (see also Yoon 2017; Chaudhury and Loi 2017). For many of these graduates, the United

States remains the destination of choice, with states like California, Washington, and New York being the most popular. Tasker (2024) notes, in this regard, that more people left Canada for the United States in 2022 than at any other point in the decade prior.

For communities like Niagara, however, the concern is not only that graduates might leave for opportunities in the United States. Students might also move to other jurisdictions *within* the country or province in pursuit of more opportunities, better salaries, and more established networks with which to collaborate and innovate. Indeed, worries about Canada's 'brain drain' are preceded by a much more extensive literature regarding the economic impacts of urbanization, and the negative consequences felt by the communities that young workers leave behind (Wolfe and Gertler 2016; Florida 2008; Florida 2002; Jacobs 1985). In the case of the Niagara region, policymakers must compete most directly with the allure of nearby Toronto, which continues to draw in talent from surrounding city-regions in Ontario. As Lee, Robertson, Swain (2010) note, Toronto "attracts more talent than it develops," including from "the ring of universities that surrounds the Greater Toronto Area."

Our survey of recent STEM graduates from Brock University and Niagara College finds that Niagara is performing relatively well in the retention of post-secondary graduates. Many students from Brock University and Niagara College appear to be living and working in the Niagara region following graduation, citing job opportunities and connections to friends and family as critical factors influencing their decision to work in the region. There is a consensus among graduates that the region remains an attractive place to live, and Niagara continues to perform well regarding its relative cost and quality of living. This is consistent with Blushak et al. (2009) who find that Niagara does a decent job of retaining young people relative to cities like Kingston or Saskatoon.

Still, most graduates are choosing to work outside of Niagara after their studies, with alumni from Brock University being slightly more likely to do so compared to graduates from Niagara College. Even some of those currently living in the region are working elsewhere, suggesting that they are either commuting or working remotely. Those working elsewhere are especially critical of the job opportunities and compensation packages available to them within Niagara and are skeptical regarding the competitiveness of Niagara-based companies. They also disagree with the suggestion that Niagara is a hub for innovation in their field.

This is consistent with existing research on the 'brain drain' phenomenon, which suggests that higher pay, firm reputation, and the scope of available work are key factors influencing the emigration of high-skilled labour in Canada (Spicer et al. 2018; Docquier and Rapoport 2011; Zhao et al. 2000; Kesselman 2001; Saltzman 2017; Canadian Press 2023). Phillips and Durant (2017) similarly find that job opportunity and cost of living rank as the most important factors influencing where post-secondary students in Niagara choose to live and work following graduation. Blushak et al. (2019) note that many who leave Niagara following graduation express regret with their having to work elsewhere, but list practical barriers around cost and employment opportunity as reasons for their decision. Collectively, these findings suggest a fundamental tension between graduates' perception of Niagara as a place to live and their opinions on the local economy, and that the former does not necessarily offset the latter.

While Niagara College graduates are finding work in sectors like manufacturing, transportation and logistics, and the technology sector, Brock University graduates are flocking towards work in health care, environmental and life sciences, and teaching. In part, this reflects the different mandate and pedagogy of each institution. Very few graduates from either school are finding work in the agricultural sector, despite the relative strength of agribusiness within the region (Conteh 2023). This is consistent with Conteh et al. (2017), who find that there is a contrast between top fields of study for post-secondary students in Niagara and where they are working, with this disconnect leading many to pursue employment opportunities outside of the region. Conversely, Calcott and Conteh (2018) find that employers perceive a disconnect between the education that students receive and the sorts of skills needed to work in local industry.

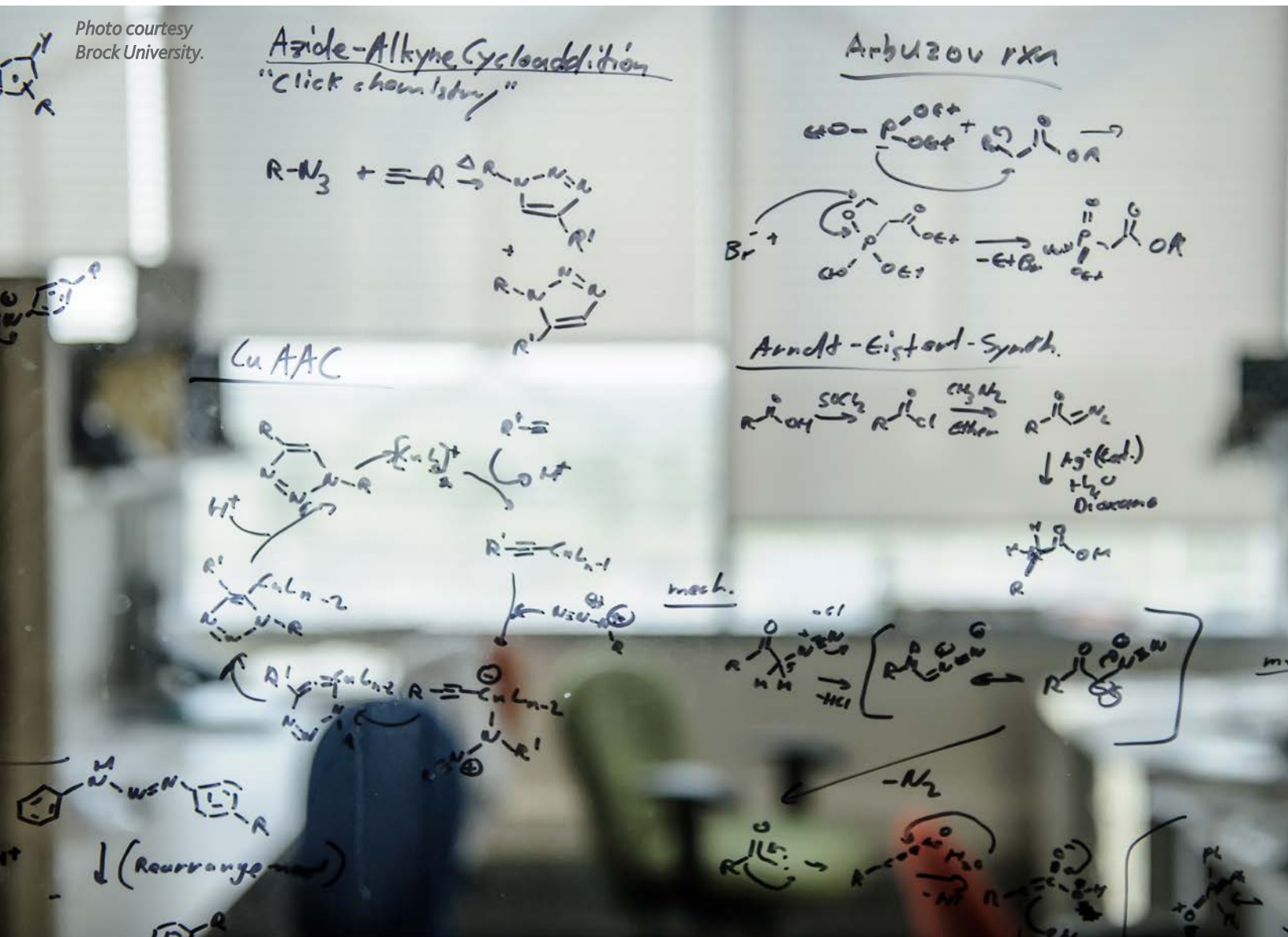
On the one hand, it is worth asking whether graduates' opinions of the Niagara economy could be improved by better marketing surrounding the types of innovation taking place within the region, and whether such efforts could help clarify Niagara's brand as the "place to be" for things like advanced manufacturing and agricultural technology. Blushak et al. (2009) write:

“...there's a stigma of Niagara that you're either working with the elderly or you're working in tourism... From the commercials, all you hear about is [Niagara's] wine industry or its tourism in Niagara Falls. If [young people] are not interested in working in either of those industries, then they'll just go find jobs elsewhere.”

Investing in initiatives that showcase the diversity and ingenuity of local businesses could help strengthen the perceived competitiveness of Niagara firms among local graduates. Spicer et al. (2018) suggest that investing in local co-op placements can also help to strengthen connections between students and the opportunities and happenings of the local economy (see also Bartik and Erickcek 2007).

On the other hand, it would be a mistake to reduce graduates' opinions to a matter of perception. Those working outside of the Niagara region *do* appear to be making more money, on average, than their counterparts within Niagara. They are also more likely to have found employment relevant to their field of study. Again, this is consistent with existing research on Canada's national 'brain drain,' which finds that discrepancies in compensation have an outsized influence on where students choose to work following graduation, particularly in STEM (Spicer et al. 2018; Canadian Press 2023).

When graduates were asked what they felt would make the Niagara region a more attractive place to work, three key themes emerged. The first, unsurprisingly, was job opportunities. Graduates were consistent in their feeling that more and better-paying job opportunities in the Niagara region would make the prospect of working locally more attractive. This is interesting insofar as some stakeholders perceive a chronic labour shortage within the region (Niagara Region, n.d.). These differing evaluations suggest one of two things. The first possibility is a lack of awareness among graduates for the opportunities that are currently available within Niagara. The second is a more fundamental disconnect between the types of work or compensation that graduates are looking for and the expectations of local employers. Part of this disconnect may be related to the rapidly rising cost of living within Niagara, and the fact that employers may be offering employment packages based on outdated assumptions about the financial pressures that employees are experiencing.



To that end, the second common theme in our survey of recent graduates was the subject of affordable and attainable housing. Simply put, many participants felt that rising housing prices are making working in the Niagara region increasingly difficult. This is notable insofar as housing in Niagara remains cheaper than many other cities in the Greater Golden Horseshoe. Hopulele (2024) finds, for instance, that the average price for a single-family home in St. Catharines or Niagara Falls in 2023 was \$629,700, compared to over one million dollars in cities like Markham, Mississauga, Burlington, or Oakville. The average rent for a two-bedroom apartment in the Niagara region is also lower than the provincial average, and much lower than apartments in nearby Toronto (Canada Mortgage and Housing Corporation 2024).

How, then, can we square the perception of recent Niagara graduates with this comparative view of Niagara's housing ecosystem? For starters, it is important to note that, while housing in Niagara may remain *relatively* cheaper than other cities in Ontario, housing prices in the region have nevertheless increased both significantly and rapidly over the past decade. A recent report by the Canada Mortgage and Housing Corporation (2024) finds, for example, that:

Rents have grown faster than incomes in the St. Catharines-Niagara region. This has left even middle-income rental households with fewer affordable options. In this context, an affordable dwelling is assumed to be one where the renter household is spending less than 30% of its before-tax income on rent. Only 56% of units were estimated to be affordable to middle-income renters earning between \$43,000 and \$56,000 annually (Table 3.1.8). More tenants stayed put to avoid facing higher rents, and vacancy rates in the lower rent ranges also declined, leaving lower-income households with fewer options.

A recent report by the Ontario Housing Affordability Task Force (2022) similarly finds that the average price for a house in Ontario has almost tripled since 2011, significantly outpacing increases to household income during this same period. **Though it is beyond the scope of this report to investigate Niagara's housing market in detail, the fact that housing prices are outpacing wage increases suggests that the affordability of housing may be decreasing in absolute terms for Niagara workers.**

Second, it is important to consider the tools available to young workers to manage rising housing costs. For instance, as the cost of homeownership increases, many graduates may choose to use public transit, active transportation, and ridesharing services to avoid the cost of car ownership, putting that money towards housing and other costs instead. As those surveyed made clear, however, working in the Niagara region depends largely on the ability to own a private vehicle. While housing is concentrated in urban areas like St. Catharines, Niagara Falls, and Welland, participants noted that jobs are located across the Niagara Peninsula, including a cluster of jobs in the tourism industry in Niagara-on-the-Lake.

We mention Niagara-on-the-Lake specifically because there are no regular transit routes connecting workers to the town, making it a prime example of how many survey respondents felt that maintaining a job in the region without a car would be impossible. This means that, while housing costs in Niagara may be cheaper than a city like Toronto, the absolute cost of living in the region may be higher than it seems. Indeed, some graduates said they had moved back to cities where living without a car is more feasible. The third most common thing that graduates felt could make Niagara a more attractive place to work was therefore convenient and effective public transit.

This is consistent with Blushak et al. (2009), who find that graduates in Niagara feel constrained in their job searches because of the lack of transit connections between municipalities. In addition to limiting job prospects, Blushak et al. (2009) argue that this lack of connectivity limits the ability of students to plant roots within the Niagara region, with limited experiences outside of malls, restaurants, and bars. Indeed, the lack of convenient and rapid public transit access can be especially detrimental for post-secondary students, over half of whom do not drive or have access to an automobile (Gervais 2020).¹ Though the recent transfer of responsibility for public transit to the Niagara Region promises to improve the efficacy of intraregional transit, the long-term outcome of this initiative remains to be seen.

Moving forward, there is a need for further research to explore connections between talent retention, housing, and public transit in Niagara. As this survey of recent graduates suggests, investments in housing and transit service may have economic value beyond their direct impact on housing costs or transportation equity. They may also make the region a more accessible and attractive place to live and work for young workers in the early stages of their career, connecting workers to employment opportunities that may otherwise be out of reach.

¹ Gervais (2020) finds that these barriers are felt more poignantly along gendered and racialized lines, with women feeling less safe than men in using alternative transportation and international students experiencing a poor sense of belonging while on campus.

CONCLUSION & RECOMMENDATIONS

This report has aimed to shed light on talent retention patterns in the Niagara region at a time when the region's economy is undergoing significant transformation. Through a survey of recent graduates from Brock University and Niagara College, it has explored the post-graduation experience of alumni from select STEM programs. Graduates were asked whether they are currently living and working in the Niagara region, and to provide their opinions on Niagara's economic landscape.

Our survey suggests that Niagara is performing relatively well in the retention of post-secondary graduates. Many students from Brock University and Niagara College appear to be living and working in the Niagara region following graduation, citing job opportunities and connections to friends and family as critical factors influencing their decision to work in the region. There is a consensus among

graduates that the region remains an attractive place to live, and Niagara continues to perform well regarding its relative cost and quality of living.

Still, most graduates (61.3 per cent) are choosing to work outside of Niagara after their studies. Even some of those currently living in the region are working elsewhere, suggesting that they are either commuting or working remotely. These graduates were especially critical of the job opportunities and compensation available to them in Niagara and disagreed with the suggestion that Niagara is a hub for innovation in their field. When asked what could be done to make working in the Niagara region more attractive, respondents mentioned the need for more job opportunities, more affordable housing, and better public transit. Concerningly, this feedback is quite similar to research produced by Blushak et al. (2009) over a decade ago, which found that job opportunities and (lack of) access to public transit were the biggest factors influencing talent retention in the Niagara region.



Photo courtesy Brock University, Colin Dewar.

The following recommendations serve as a starting point for these efforts:

1. Invest in improved connections between post-secondary students and local businesses.

Our survey revealed a clear disconnect between graduates' perceptions of Niagara and the range of economic activity happening in the Niagara region. Despite emerging regional strengths in advanced manufacturing and agricultural technology, few graduates view Niagara businesses as competitive in their field, and few see Niagara as a hub for innovation. To that end, investments in improved co-op programming, 'hackathons,' and other applied initiatives can help to showcase the ingenuity of post-secondary students, while also introducing students to the range of innovative work being done by Niagara firms.

Internships and applied research fellowships, funded in part by local businesses, can also provide students with an entry-point into the local economy *prior* to graduation, while also generating research with potential value to the private sector (Spicer et al. 2018). Conversely, partnerships between post-secondary institutions and businesses can be a great way to derisk innovation for small and medium-sized businesses, who may otherwise be wary of implementing experimental technologies or hiring students without significant work experience.

More generally, there is a need to clarify Niagara's 'economic brand' and improve the domestic profile of local businesses, positioning the region as 'the place to be' for graduates interested in particular fields of work.

2. Proactively address the rising cost of living in Niagara.

Though Niagara remains relatively cheaper than other cities in the Greater Golden Horseshoe, our survey of recent graduates suggests that alumni are finding it increasingly expensive to stay in the region upon graduation, and that there is a disconnect between graduates' expectations or needs and the compensation being offered by local businesses. On the one hand, ongoing investments in new housing, rental protections, and the like promise to help address housing costs in the long term, and initiatives like the United Way's Living Wage Program help to boost local wages and mitigate the impact of inflationary pressures on local workers.

On the other hand, there are other tools that businesses can consider to make working in the region more attractive to post-secondary graduates, including profit-sharing,

cooperative ownership structures, and flexible work schedules. The latter can empower workers to save money elsewhere in their schedules by, for instance, making it possible for a young couple to share one vehicle rather than depending on two, or by cutting down on costs associated with childcare. Employee ownership trusts also have unique value in the context of succession planning, and future research should explore connections between these opportunities and the impending retirement of many local farmers, for example.

3. Invest in bus rapid transit service.

Another way that recent graduates can cut costs is by utilizing public transit. However, our survey makes it clear that graduates perceive a lack of effective and convenient transit service as a barrier to economic opportunities within the Niagara region, particularly between urban centres and the rural communities where many graduates find work in the tourism industry. On the one hand, then, Niagara Regional Transit (NRT) should continue to invest in and expand the provision of convenient and effective public transit within and between Niagara municipalities, including more rapid service along identified transit corridors (ideally coordinated with the construction of new affordable or student housing).

On the other hand, there is a need for further research exploring the economic value of public transit service in the Niagara region. Though this report has not investigated local transit in detail, existing research suggests that, even if the costs of transit service are not recuperated through a traditional fare structure, these costs may be offset by the economic value unlocked by more convenient transit services (Godavathy, Mattson, and Ndembe 2015; Jaffe 2013; Canadian Urban Transit Association 2019). Investments in improved active transportation facilities, micromobility, and bikeshare can also help to reduce economic barriers for post-secondary students, and future research should explore the viability of such programs within the Niagara region.

4. Improve connections between students and the community.

Previous research has shown, and our survey confirms, that a lack of public transit is not only preventing post-secondary students and graduates from accessing jobs in the Niagara region. It is also making it more difficult for young people to build meaningful connections to the region throughout their studies, leading many to live within a so-called 'student bubble' and then leave upon graduation (Gervais et al. 2020).

In addition to improving transit service within Niagara, policymakers should therefore invest in other initiatives that can improve the student experience and their ties to the region. For example, the construction of more student residences closer to Niagara's downtown cores, or conversion of older office buildings into purpose-built rentals, could make it easier for students to access downtown businesses, festivals, and markets (while also improving the viability of public transit services). Locating more university and college-sponsored events in the community, rather than on campus, can also help encourage students to step beyond the post-secondary bubble to enjoy local restaurants, cafes, museums, and so forth. Festivals that celebrate Niagara's growing diversity, such as St. Catharines' Holi Festival of Colour, can also help signal to students that they are welcome in the community. It is worrying, in this regard, that a handful of respondents to our survey mentioned explicitly racist encounters as a key factor in their decision to pursue work outside of the Niagara region.

The Niagara region continues to benefit from a high quality of life, proximity to Toronto, and relative affordability. Our survey of recent graduates nevertheless makes it clear that there are challenges to talent retention efforts in the region. Some of these challenges, such as the lack of effective inter- and intra-regional transit, are longstanding. Others, such as rising housing costs, are more recent, and are undermining some of Niagara's previous advantages over other communities in the Greater Golden Horseshoe. Our hope is that this survey will help to shed light on these new and familiar challenges, and that investments such as those prescribed can help to ensure Niagara's talent retention landscape looks different 10 years from now.

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APPENDIX A: POST-SECONDARY PROGRAM INDEX (2004–2023)

School	Included Programs
Brock University	Applied Computing Biochemistry Biological Sciences Biomedical Sciences Biophysics Biotechnology Chemistry Computer Science Computer Science and Mathematics Computing and Business Data Science and Analytics Environmental Geoscience Earth and Planetary Science Communication Game Programming Earth Sciences Engineering Science Physics Oenology and Viticulture Mathematics and Statistics Neuroscience Sciences
Niagara College	Civil Engineering Technician Computer Engineering Technician Construction Engineering Technology Computer Systems—Technician—Network and Cloud Technologies Electrical Engineering Technician Electrical Engineering Technology (Co-Op) Electronics Engineering Technician Electronics Engineering Technology (Co-Op) Industrial Automation Mechanical Engineering Technician Mechanical Engineering Technology (Co-Op) Photonics Engineering Technician Photonics Engineering Technology Renewable Energies Technician

The Niagara Community Observatory (NCO) at Brock University is a public-policy think-tank working in partnership with the Niagara community to foster, produce, and disseminate research on current and emerging local issues. More information on the NCO office and an electronic copy of this report and others like it can be found on our website <https://brocku.ca/nco>

All of our Wilson Foundation-funded research can also be found on the project website: <https://exhibits.library.brocku.ca/s/NiagEconHist>

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