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www.workforcewindsor.essex.com

880 N Service Rd #201, Windsor ON N8X 3J5

Phone: 226-674-3220

info@workforcewindsor.essex.com

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EXECUTIVE SUMMARY

Through consultations with local employers in the summer of 2016, Workforce WindsorEssex recognized there is a growing concern in Windsor-Essex regarding the availability and stability of an ICT workforce. ICT talent often leaves the area in search of better career opportunities and higher wages. In this report, we examine the state of the current ICT workforce and workforce environment in Windsor-Essex, laying out the thoughts of employers, students, workers, and other stakeholders. We consider challenges and opportunities in ICT workforce development for our region and reflect on why this issue is important to Windsor-Essex.

The ICT workforce in Windsor-Essex has remained stable since 2011, but it has not seen any significant growth. Employers are finding it difficult to recruit talent, finding that few candidates have the skills they require, and those who are skilled leave the area, work remotely or in Southeastern Michigan, or can demand a wage employers cannot afford to pay. Students, in turn, believe they will be qualified for positions when they graduate, though many plan on leaving Windsor-Essex as they perceive there to be better career opportunities elsewhere. Workers who have remained in Windsor-Essex appear to be largely satisfied with their careers, though some have indicated higher wages and more interesting projects would improve the ICT workforce environment in the region.

Reflecting on the thoughts of employers, students, workers, and other stakeholders, we identified 8 challenges and opportunities in the ICT workforce environment in Windsor-Essex. In sum, the opportunity to improve the ICT workforce environment lies in increased student-industry engagement, furthering engagement with females, attracting talent to the region, educating local businesses on the value of ICT, and increased educator-industry engagement. If the availability and stability of a qualified ICT workforce in Windsor-Essex is strengthened, Windsor-Essex will see increased economic growth, stable jobs, and competitiveness supported by innovation.

As stakeholders look to implement the recommendations made in this report, they should not lose sight of the future of ICT and should take into account the workplaces needed to attract and retain ICT talent, the skills a capable ICT workforce will need, and the emerging occupations the region can integrate into businesses to drive innovation.

By working together, stakeholders can create a more available, stable, and growing ICT workforce in Windsor-Essex.

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INTRODUCTION

Workforce WindsorEssex is the region's Local Employment Planning Council.

Through our work, we have the opportunity to connect and meet with local employers to learn about their workforce conditions. In 2016, we met with 64 employers, 3 industry associations, and 4 employment service providers to learn about their workforce needs. A consistent theme during these consultations was the difficulty in recruiting Information and Communication Technology (ICT) talent.

Between June and October 2017, we met with 69 employers and 4 employment service providers to delve deeper into these challenges. Of the employers, 10 can be considered to be direct ICT employers who employ a substantial amount of ICT staff in their facility. We also surveyed 32 students in local ICT programs and 51 local ICT workers to gain their perspective on ICT challenges in Windsor-Essex. We analyzed this data using MAXQDA, a mixed methods analysis software program. The results from these surveys are contained in this report.

To establish recommendations and actions to counter these challenges, Workforce WindsorEssex has been undertaking several initiatives. First, we have been hosting quarterly ICT Leadership Table discussions. At each meeting, employers, educators, ICT workers, ICT students, and community organizations gather to discuss local ICT issues and offer suggestions to improve the ICT workforce environment in Windsor-Essex. Second, we filmed video profiles with 6 local ICT companies to showcase the opportunities available in our region. These videos will be shown at local educational institutions, featured on our website, and promoted on social media by ourselves and our partners to encourage ICT talent to explore opportunities in Windsor-Essex. Third, a bulletin of recommendations will accompany this report and will be shared with key stakeholders who can carry out actions related to the opportunities presented. Following the release of this report, Workforce WindsorEssex will continue work on these initiatives and will offer support within our mandate to implement recommendations.

WHAT IS INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)?

The Brookfield Institute defines Information and Communication Technology as “Producing goods or services, or supplying technologies used to process, transmit, or receive information”.¹For the purposes of this report, we include the following occupations from the National Occupational Classification (NOC) in our understanding of the ICT workforce:

NOC Code	Occupation
0213	Computer and information systems managers
2147	Computer engineers (except software engineers and designers)
2171	Information systems analysts and consultants
2172	Database analysts and data administrators
2173	Software engineers and designers
2174	Computer programmers and interactive media developers
2175	Web designers and developers
2281	Computer network technicians
2282	User support technicians
2283	Information Systems Testing Technicians

When referencing ICT occupations or the ICT labour force in the report, this includes all abovementioned occupations. We do not analyze based on sectors as many sectors can employ the occupations listed above and also employ unrelated occupations. For example, the ICT sector itself may employ the above occupations but also employs accountants, human resources professionals, receptionists, and other occupations.

¹ Creig Lamb and Matthew Seddon, “The State of Canada’s Tech Sector, 2016,” Brookfield Institute, July 2016, 13, <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.



WHAT IS THE DIFFERENCE BETWEEN “ICT” AND “TECH”?

The terms “ICT” and “tech” are often used interchangeably; however, they are not one in the same. Instead, ICT is part of tech. The Brookfield Institute offers a good explanation of this:

The tech sector has been traditionally defined as companies operating in the information and communications technology (ICT) industry. However, technology use and production is now ubiquitous across all sectors. The result is a much more encompassing tech sector, made up of a diverse collection of industries... [The Brookfield Institute’s] custom definition [of tech] includes 22 industries: 10 in manufacturing, 1 in wholesale trade, 6 in the information and cultural industries, 4 in professional, scientific and technical services, and 1 in other services...²

As mentioned in the above section, this report examines the ICT workforce only, which is contained in the wider tech workforce.

² Creig Lamb and Matthew Seddon, “The State of Canada’s Tech Sector, 2016,” Brookfield Institute, July 2016, 10-11, <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.

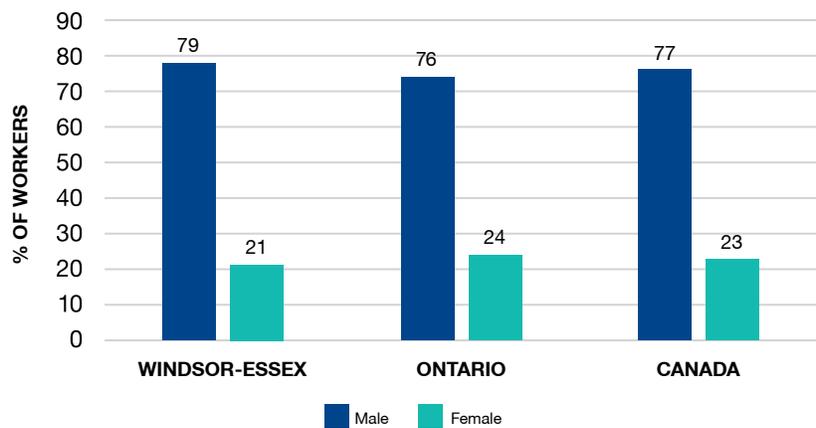
WHAT DOES THE ICT WORKFORCE LOOK LIKE IN WINDSOR-ESSEX* ?



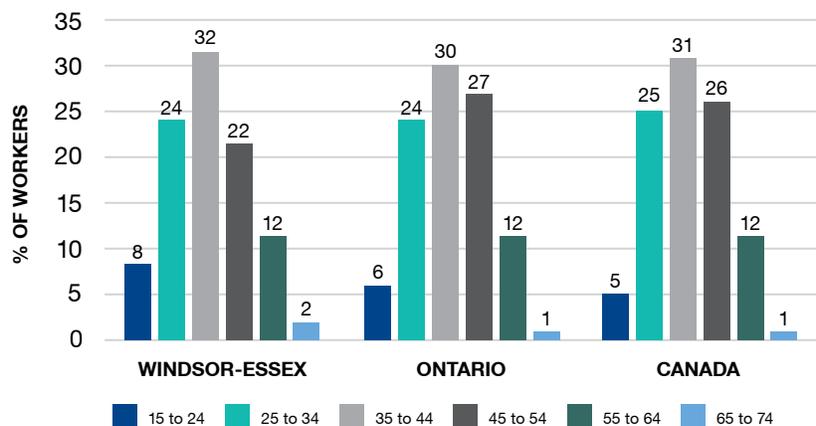
According to Statistics Canada's 2016 Census, there are 2,960 people in the ICT labour force in Windsor CMA** and 125 in Leamington CA***, for a total of 3,085 people in the ICT labour force in Windsor-Essex. The ICT labour force in Windsor-Essex accounts for 1.7% of the 184,775 person labour force. This compares at 4% for Ontario and 3% for Canada.³

The ICT workforce in Windsor-Essex is male-dominated, with 79% males and 21% females. This compares at 76% males and 24% females in Ontario and 77% males and 23% females in Canada. The ICT workforce is relatively middle-aged in Windsor-Essex, with the largest proportion of workers (32%) between ages 35 and 44. This trend is mirrored in both Ontario and Canada.⁴

Gender of the ICT Workforce in 2016⁴



Age of the ICT Workforce in 2016⁴



* Due to data availability, Windsor-Essex only includes the municipalities of Windsor, Tecumseh, LaSalle, Lakeshore, Amherstburg, Leamington, and Kingsville and excludes the municipalities of Essex and Pelee.

** CMA – Census Metropolitan Area. Windsor CMA includes Windsor, Tecumseh, LaSalle, Lakeshore, and Amherstburg.

*** CA – Census Agglomeration. Leamington CA includes Leamington and Kingsville.

³ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

⁴ Ibid.

The following is a breakdown of the occupations of those who are in ICT occupations in Windsor-Essex and the location quotient of these occupations. The location quotient is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. A location quotient of 1 indicates the concentration of employment in an occupation is the same as Canada's concentration of employment in that occupation. If it is less than 1, employment in the occupation in the region is less concentrated than the rest of Canada. If it is greater than 1, employment in the occupation in the region is more concentrated than the rest of Canada.

ICT OCCUPATIONS IN WINDSOR-ESSEX IN 2016

Occupation	Total Labour Force ⁵	Employed ⁵	Unemployed ⁵	Location Quotient ⁶
0213 Computer and information systems managers	230	220	10	0.32
2147 Computer engineers (except software engineers and designers)	140	140	0	0.32
2171 Information systems analysts and consultants	810	785	30	0.54
2172 Database analysts and data administrators	125	120	10	0.41
2173 Software engineers and designers	270	270	0	0.18
2174 Computer programmers and interactive media developers	550	525	20	0.48
2175 Web designers and developers	105	105	0	0.24
2281 Computer network technicians	440	420	15	0.58
2282 User support technicians	395	380	25	0.86
2283 Information systems testing technicians	20	20	0	0.70
Total	3085	2985	110	Average 0.46

Information Systems Analysts and Consultants are the most represented in the ICT workforce in Windsor-Essex, followed by Computer Programmers and Interactive Media Developers; Computer Network Technicians, and User Support Technicians. Unemployment in the industry is extremely low, with only 110 people reporting they were unemployed at the time of the 2016 Census. Looking at the average location quotient of 0.46, we can see the concentration of employment in ICT occupations in Windsor-Essex is much lower than the rest of Canada. ⁶

⁵ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

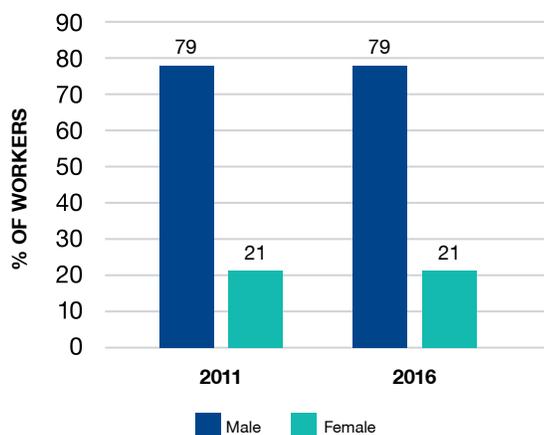
⁶ Emsi Analyst, 2017.3.

HOW DID THE ICT WORKFORCE IN WINDSOR-ESSEX CHANGE SINCE 2011?

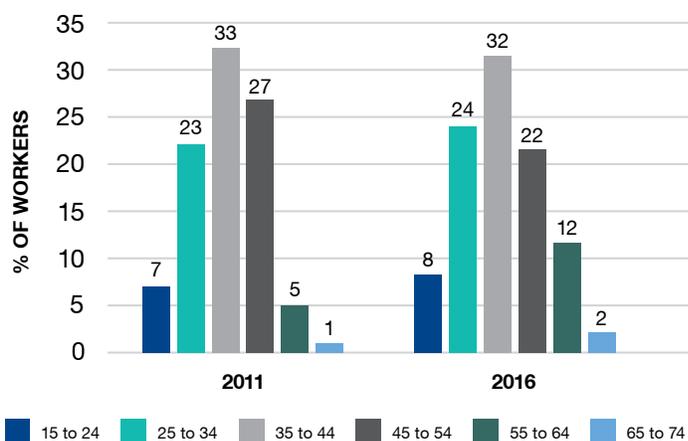


Between 2011 and 2016, Windsor-Essex gained 80 workers in ICT. In both 2011 and 2016, ICT workers made up 1.7% of the labour force in Windsor-Essex. This compares to a 0.4% increase from 2011 to 2016 in Ontario, increasing from 3.6% in 2011 to 4.0% in 2016. Canada saw an increase of 0.1% from 2011 to 2016, increasing from 2.9% in 2011 to 3.0% in 2016. ^{7,8}

Gender of the ICT Workforce in 2016^{7,8}



Age of the ICT Workforce in 2016^{7,8}



The ICT workforce in Windsor-Essex saw very little change in gender between 2011 and 2016. Males remained 79% of the workforce, while females remained 21% of the workforce. The percentage of those nearing retirement age grew from 2011 to 2016, with the 55 to 64 age group increasing by 7%. The younger workforce also increased slightly, with the 15 to 24 age group and 25 to 34 age group each increasing by 1%. ^{9,10}

⁷ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

⁸ Statistics Canada, 2011 National Household Survey, Statistics Canada Catalogue no. 99-012-X2011033.



The following is a breakdown of the changes in the ICT labour force from 2011 to 2016:

ICT OCCUPATIONS IN WINDSOR-ESSEX: 2011-2016

Occupation	Total Labour Force 2016 ⁹	Total Labour Force 2011 ¹⁰	(+/-)
0213 Computer and information systems managers	230	155	+75
2147 Computer engineers (except software engineers and designers)	140	145	-5
2171 Information systems analysts and consultants	810	805	+5
2172 Database analysts and data administrators	125	55	+70
2173 Software engineers and designers	270	195	+75
2174 Computer programmers and interactive media developers	550	410	+140
2175 Web designers and developers	105	115	-10
2281 Computer network technicians	440	495	-55
2282 User support technicians	395	600	-205
2283 Information systems testing technicians	20	30	-10
Total	3085	3005	+80

Overall, employment in ICT increased 80 persons between 2011 and 2016 in Windsor-Essex. Computer Programmers and Interactive Media Developers saw the biggest increase by 140 persons, while User Support Technicians saw a decline of 205 persons. ^{11,12}

⁹ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

¹⁰ Statistics Canada, 2011 National Household Survey, Statistics Canada Catalogue no. 99-012-X2011033.

¹¹ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

¹² Statistics Canada, 2011 National Household Survey, Statistics Canada Catalogue no. 99-012-X2011033.

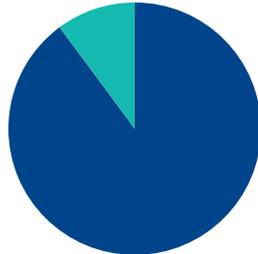
WHAT ARE EMPLOYERS SAYING?

Are you currently facing challenges in the recruitment of employees?

Yes (90%) No (10%)

Reasons:

- Candidates lacking technical skills
- Competition with the U.S. for talent
- Few or no applicants

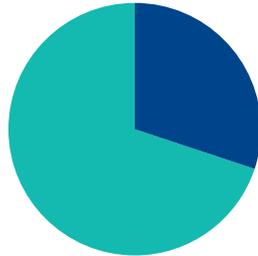


Are you currently facing challenges in the retention of employees?

Yes (30%) No (70%)

Reasons:

- Cannot offer interesting enough projects
- Cannot afford to pay higher wages

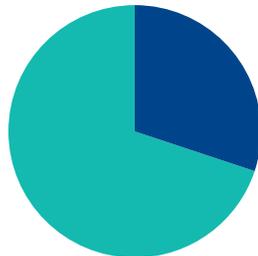


Are the current programs offered by local educational institutions producing candidates with adequate skills?

Yes (30%) No (70%)

Reasons:

- Curriculum is outdated
- Students lack practical experience
- Students lack soft skills/ personal qualities
- Students lack technical skills

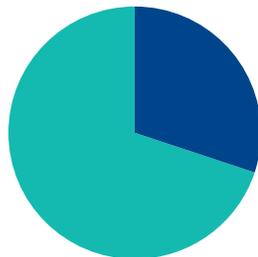


Do you require a formal education for the positions you hire for?

Yes (30%) No (70%)

Reasons:

- Candidates are competent without education
- Work experience can replace education
- Informal education is available



In the summer of 2017, Workforce Windsor Essex undertook one-on-one consultations with 10 employers in Windsor-Essex that directly employ ICT staff, asking questions about recruitment, retention, education, experiential learning, hard-to-fill positions, and the ICT environment in Windsor-Essex.

9 of the 10 ICT employers indicated they are facing challenges in the recruitment of employees. Their recruitment challenges are diverse, and they provided details about each of their challenges.

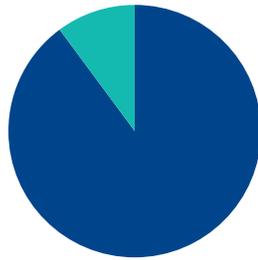
First, candidates are lacking technical skills. They lack knowledge of coding languages such as PHP and JavaScript, they are not aware of frameworks like Bootstrap, Laravel, and PhoneGap, and some of the skills they do possess lack depth. 7 of the 10 employers believe educational institutions could better prepare students for jobs in ICT and believe the curriculum is outdated. They would like to see students gain more practical experience in the classroom as well as enhance their soft skills while they are in school.

Conversations with educators at St. Clair College and the University of Windsor have led to acknowledgement of the slow pace of curriculum development; however, educators stated they attempt to address this challenge by introducing new technologies in their classrooms outside of the formal curriculum and by providing opportunities for experiential learning.

For example, St. Clair College has a web development course in which students develop a website for an organization, working directly with that organization to meet their requirements. The University of Windsor provides internship opportunities for Masters of Applied Computing students to work directly in employers' workplaces. These are just two of the many examples of experiential learning that St. Clair College and the University of Windsor have implemented to

Do you offer experiential learning opportunities?

Yes (90%) No (10%)

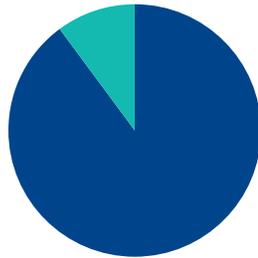


Reasons:

- Post-secondary cooperative education
- Internship placements
- High school co-operative education

Do you have any hard-to-fill positions?

Yes (90%) No (10%)



Hard-to-fill positions include:

- App Developer
- Business Analyst
- Full-Stack Developer (Senior)
- Game Designer
- Help Desk
- Product Manager
- Project Manager
- Software Developer (Senior)
- Special Effects/Animator
- Systems Analyst
- Technician (Senior)
- UI/UX Designer
- Web Designer
- Web Developer (Senior)

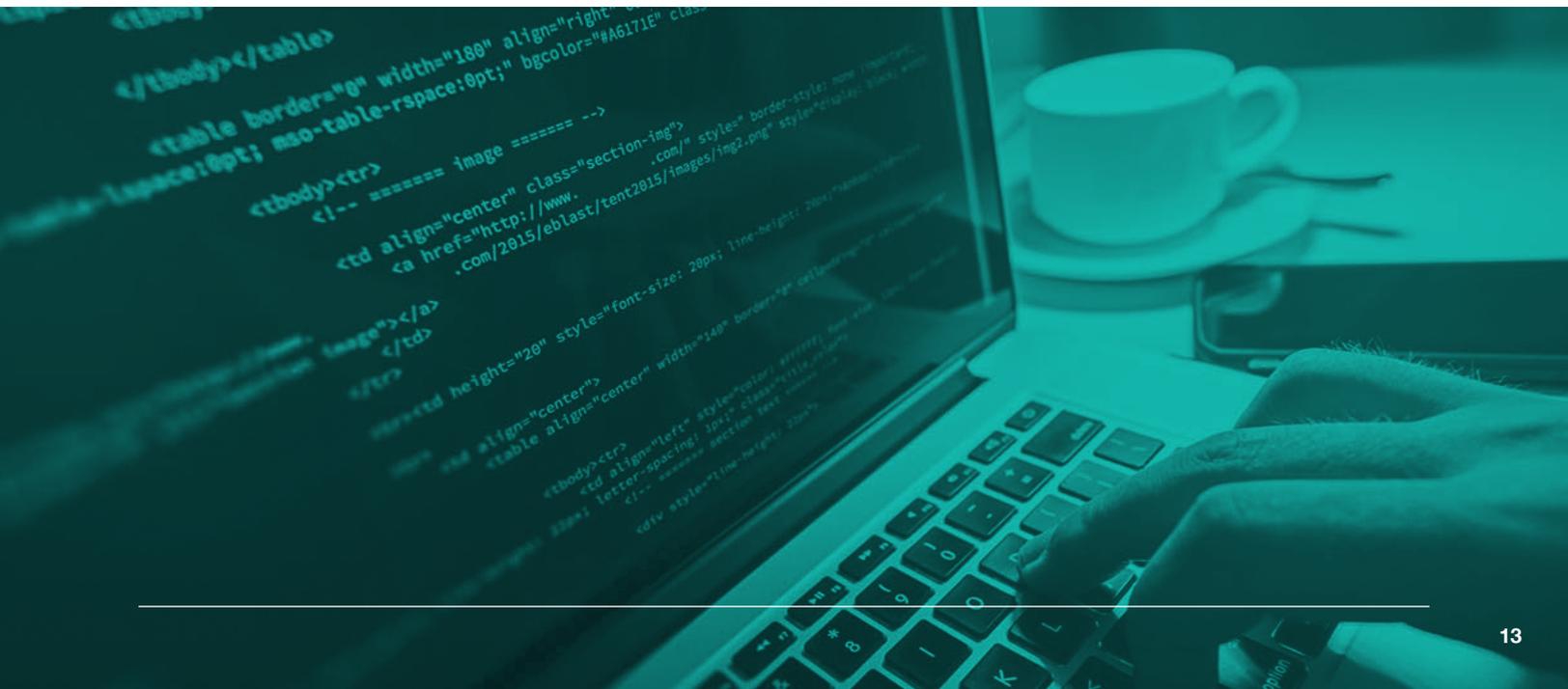
attempt to close the gap between employers' expectations and students' skills.

Second, employers experience competition with the U.S. when recruiting candidates as American companies can often offer a higher wage and more upward career mobility than companies in Windsor-Essex. This is mirrored in employers' retention issues. While only 3 employers stated they have retention issues, they indicated these issues are due to an inability to offer interesting projects and to pay a higher wage.

Third, employers are experiencing a general lack of applicants to posted jobs. This is despite the fact that only 3 employers said they require a formal education. Others noted that candidates can be competent without an education and can learn skills through informal education.

9 of the 10 employers offer experiential learning opportunities such as Co-operative education placements and internships and indicated they often use experiential learning as a tool for hiring.

Recruitment challenges for ICT employers are wide-ranging when it comes to positions that are hard to fill. Positions vary from developers to analysts to project managers, though employers have a harder time recruiting intermediate or senior talent than junior talent in any position.



When asked about ways to improve the ICT workforce environment in Windsor-Essex, employers had many ideas, including the following:



Employers would like to see a better environment for the ICT workforce in Windsor-Essex and can see this happening through local initiatives.

In the business realm, employers would like their job opportunities to be better promoted within and outside the community to aid in the attraction of talent to their companies. In turn, they would like to see promotion of the region to increase their business, leading to increased profit to enable them to pay higher wages. Employers believe more grants for established businesses, not just start-ups, should be available to help them remain competitive. Wage subsidies could be part of these grants and would be useful to ensure Windsor-Essex companies can attract and retain talent that will help them remain competitive.

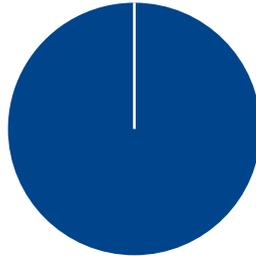
In the educational realm, employers have suggested higher standards in the classrooms would help them be able to hire recent graduates who will add value to the company quickly, rather than spending additional time and dollars training recent graduates. To establish higher standards, employers are willing to be polled about curriculum and provide input as to the standards they would like to see achieved in educational institutions.

WHAT ARE STUDENTS SAYING?

In the fall of 2017, Workforce Windsor-Essex delivered a survey to 32 current ICT students at St. Clair College and the University of Windsor.

Do you feel your program is doing a good job of preparing you for a future job in the ICT sector?

■ Yes (100%)



Program strengths:

1. Variety of content taught
2. Quality of faculty
3. Internship opportunity/practical experience

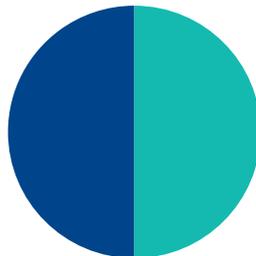
Program weaknesses:

1. Content is not covered in-depth
2. Facilities need improvement
3. Lack of cross-stream/cross-platform coding

Are you planning on staying in Windsor-Essex or leaving the region after graduation?

■ Staying (50%)

■ Leaving (50%)



Top reasons to leave:

1. Better career mobility opportunities
2. Types of projects offered elsewhere
3. City's quality of life
4. Higher wages elsewhere

Top reasons to stay:

1. Cost of living
2. Location of friends/family
3. City's quality of life

100% of students surveyed felt their program was doing a good job preparing them for a future in the ICT sector. When asked about program strengths, students were happy with the variety of content being taught, the quality of their professors, and, depending on their program, the opportunity to gain practical experience either in the classroom or through an internship.

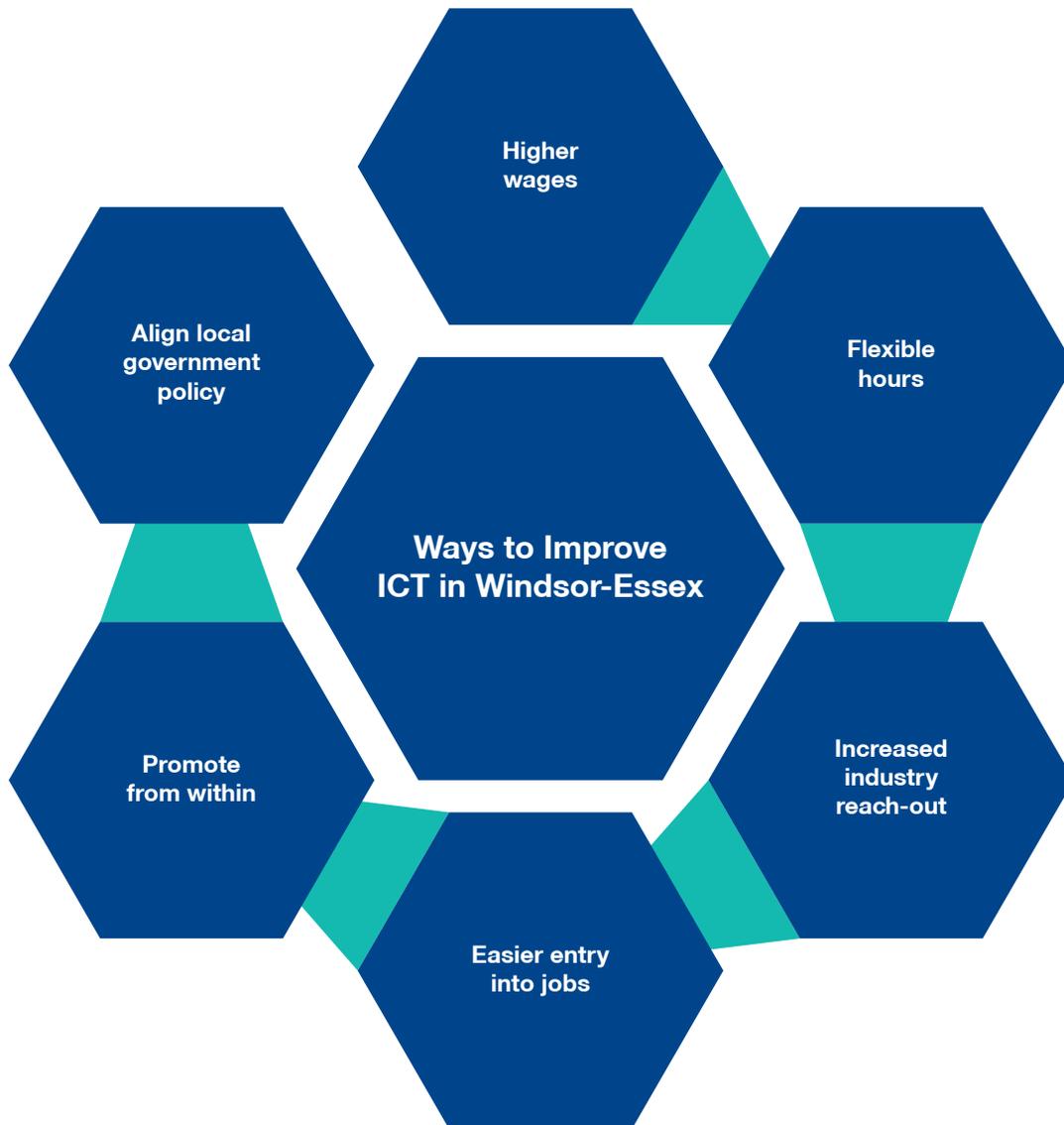
Half of the students surveyed plan to leave Windsor-Essex upon graduation, while half plan to stay. Those who plan to leave believe they will find better career opportunities, wages, and projects elsewhere and don't believe Windsor-Essex has a good quality of life as a city. Alternatively, those who plan to stay note the city's quality of life and cost of living as reasons why they would stay but also state they want to stay due to their friends and family also living here.

Students were asked what items are most important to them in their future workplace.

While students value receiving fair wages for their work, they also want to be in a flexible environment where they can grow professionally. Students want to know they can move up in a company and will have the opportunity to improve their skills once they're employed. They also want the flexibility of working from home, which is typical in many ICT positions.



When asked about ways to improve the ICT workforce environment in Windsor-Essex, students had many ideas, including the following:

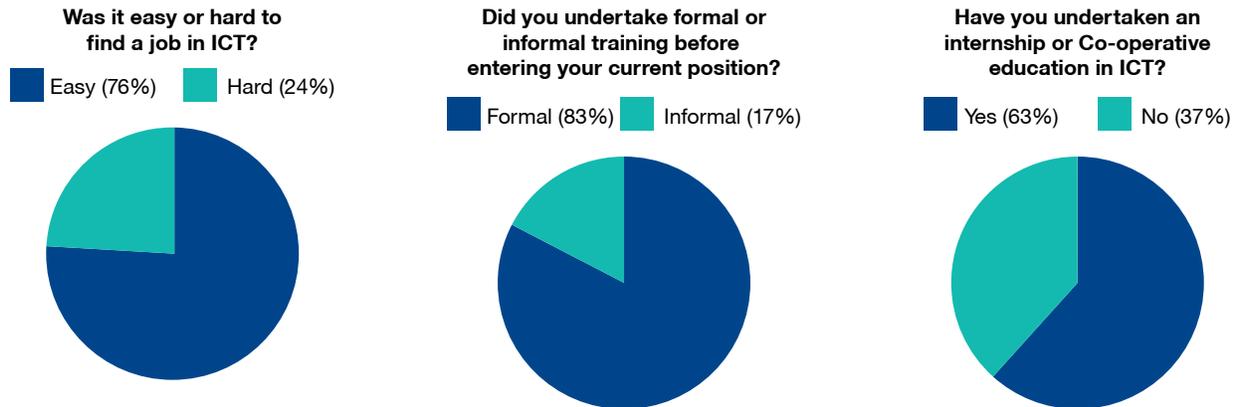


Students would like to see many improvements to the ICT workforce environment in Windsor-Essex.

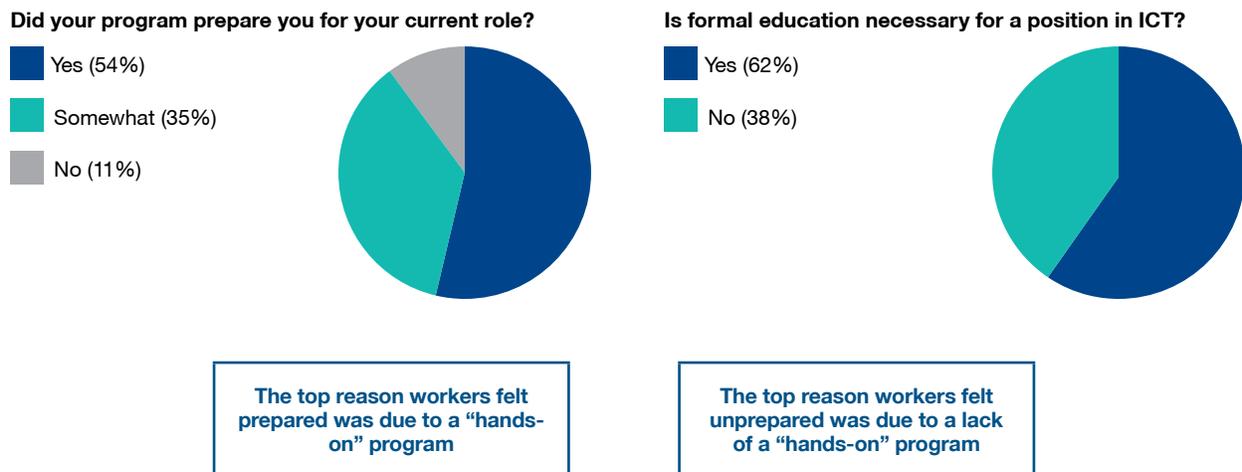
As aforementioned, students value competitive wages as well as flexibility. Contrary to popular belief, not all students want to move from company to company. Instead, many want to work their way up but feel it is difficult to get the chance to even get hired in a junior position at a company. Additionally, students want to see more industry reach-out to help them discover local opportunities and expectations. Furthermore, like employers, students want to see local government policies that will spur more growth of ICT in Windsor-Essex.

WHAT ARE WORKERS SAYING?

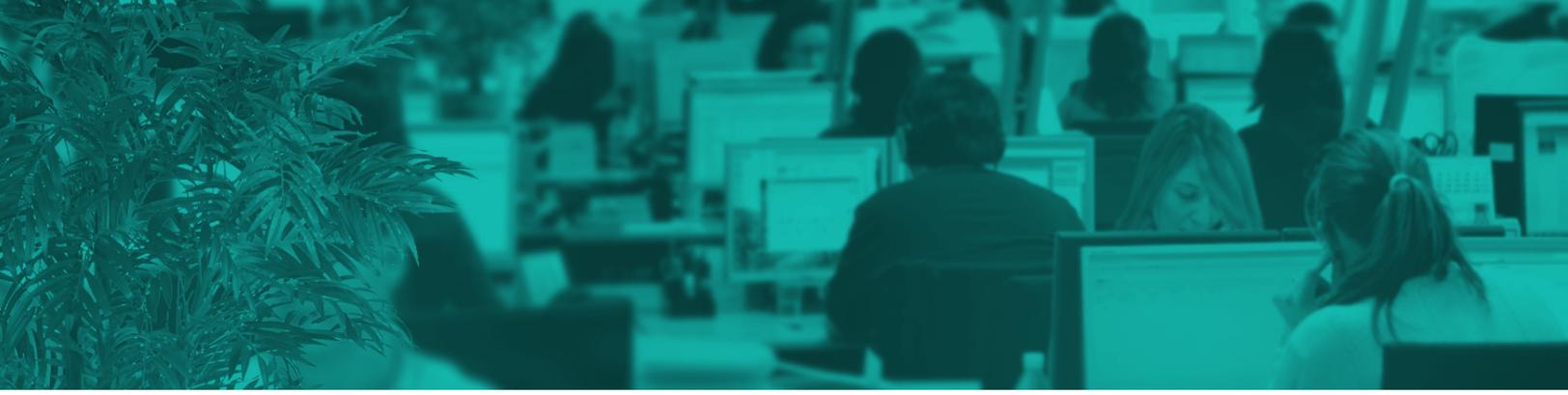
In the fall of 2017, Workforce Windsor-Essex carried out a survey with 51 current ICT workers in Windsor-Essex.



When last looking for a job in Windsor-Essex, 76% of respondents found it easy to find a job in ICT locally. 83% completed a formal training program, with most completing programs at St. Clair College or the University of Windsor, but some completing programs in London, in Toronto, and as far away as France and the United Kingdom. 63% completed an internship or Co-operative education, which some attributed to helping them find employment after graduation.

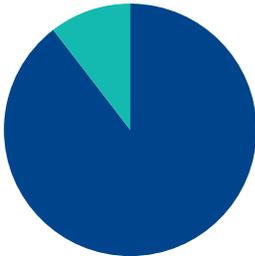


Only a little over half of worker respondents felt their program fully prepared them for their current role. Interestingly, having a hands-on program was the top reason workers felt prepared, while not having a hands-on program was the top reason workers felt unprepared. However, 62% of workers felt a formal education is necessary for a position in ICT, demonstrating the positive role formal education can play in employment.



Have you heard of ICT talent leaving the region to pursue career opportunities elsewhere?

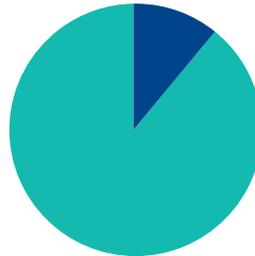
Yes (80%) No (20%)



Respondents believe people have left for higher wages and better career opportunities elsewhere

Have you left the region at any point in the past to pursue career opportunities in ICT?

Yes (18%) No (82%)

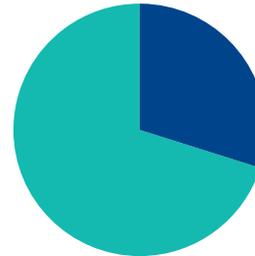


The top reason for leaving in the past was "better work opportunities"

The top reason for staying in the past was the "location of family and friends"

Are you thinking about leaving the region in the future to pursue career opportunities in ICT?

Yes (30%) No (70%)



Those who are thinking about leaving want to pursue better career opportunities with higher wages

Those who will stay are staying because their friends/family are located in Windsor-Essex

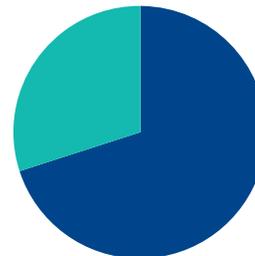
Respondents were asked if they have heard of ICT talent in Windsor-Essex leaving the region to pursue career opportunities elsewhere, and 80% responded that they have heard of this happening, with most indicating this is due to higher wages and increased ability to further one's career elsewhere. 18% had left the region themselves in the past to find better work opportunities, while many of the 82% who had never left stayed because of family and friends.

30% of respondents indicated they are thinking about leaving in the future to pursue better career opportunities with higher wages, while again, those who are planning to stay in the region are doing so due to the location of their friends and family.

Due to the location of Windsor-Essex on the Michigan border, ICT workers in Windsor-Essex can often pursue opportunities in southeastern Michigan. 58% of respondents would consider pursuing these opportunities, while 42% would not as they consider the border and the commute to be barriers to their employment there.

Are you aware of ICT career opportunities in southeastern Michigan?

Yes (68%) No (32%)



58% of respondents would consider pursuing these opportunities

42% would not consider pursuing these opportunities, listing reasons like the "border" and the "commute"

Workers were asked what items are most important to them in their workplace. These were their top items:



Much like students, workers also consider competitive wages to be essential to a good workplace. However, workers value flexible, full-time hours more than students, and they also see the advantage in having a comprehensive benefits package.

When asked about ways to improve the ICT workforce environment in Windsor-Essex, workers had many ideas, including the following.



Workers would like to see a variety of improvements to the ICT workforce environment in Windsor-Essex.

In terms of the workplace, higher wages and better career opportunities would help attract and retain ICT talent locally. Ensuring Windsor-Essex companies offer unique benefits and training for workers could help companies be more competitive for talent. Investment in current technology might also drive workers to stay with companies that operate outside of the ICT industry or might help drive up ICT profits, which in turn can provide a better environment for workers.

Workers would also like to see the region promoted to companies to bring new opportunities for employment and growth to Windsor-Essex.

WHAT DOES THIS MEAN? WHAT CAN WE DO ABOUT IT?

8 CHALLENGES AND OPPORTUNITIES TO BUILD A BETTER ENVIRONMENT FOR ICT IN WINDSOR-ESSEX

Windsor-Essex's ICT workforce saw very little growth between 2011 and 2016, increasing by only 80 jobs over 5 years.^{13,14} The Statistics Canada data collected from the 2011 National Household Survey and the 2016 Census as well as the consultations and surveys undertaken by Workforce WindsorEssex lend a narrative as to why the ICT workforce remains only stable rather than truly growing. By examining this data, there are evident challenges and opportunities for ICT in Windsor Essex.

1. ***The Challenge: Students believe their program is doing a good job preparing them for a future job in ICT, while employers do not.***

At the moment, students have very little opportunity to engage with the ICT industry outside of internships. Many do not realize what the expectations of industry are, and many employers do not understand the student perspective. 100% of students feel their program is doing a good job preparing them for a future in ICT, whereas 70% of employers disagree.

The Opportunity: Increased student-industry engagement.

Local educational institutions can partner with ICT companies in Windsor-Essex to host engagement opportunities like tours, panels, and presentations geared toward students, so students and employers can better understand their respective expectations.

2. ***The Challenge: Young people find it difficult to secure entry-level employment.***

Like other regions, Windsor-Essex ICT employers continue to employ less young people than middle-aged people, with those aged 15 to 34 making up 32% of the workforce and those aged 35 to 54 making up 54% of the workforce.¹⁵ While some of this difference can be attributed to young people attending secondary and post-secondary education, this factor cannot account for a 22% difference. Students suggested easier entry into jobs as a way to improve the ICT environment in Windsor-Essex.

The Opportunity: Embrace experiential learning and eager recent graduates.

Employers who host students for internships or Co-operative education can benefit from helping these students gain experience while they're still in school, making them more employable as graduates. Additionally, employers can use the opportunity to "test-drive" students and can offer them employment before graduation. Both St. Clair College and the University of Windsor support experiential learning for students in their ICT programs. Workforce WindsorEssex has an Experiential Learning Hub to help employers, educators, students, and parents learn more about opportunities, which can be accessed at: <http://www.workforcewindsor.essex.com/experiential-learning-hub/>. Alternatively, employers can take advantage of grants like the Canada-Ontario Job Grant to train new hires, reducing

¹³ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

¹⁴ Statistics Canada, 2011 National Household Survey, Statistics Canada Catalogue no. 99-012-X2011033.

¹⁵ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

the financial costs of hiring a recent graduate who may not have the entire skillset required by an employer but who is eager to learn and work. Employers can find more grants using Workforce WindsorEssex's WEsearch tool (<https://www.workforcewindsoressex.com/wesearch/>), which allows for easy navigation of resources available locally.

3. *The Challenge: Students want to leave the region after graduation.*

50% of students indicated they are thinking of leaving the region after graduation to pursue better career opportunities, higher wages, and a city with a higher quality of life. Students leaving the region decreases the availability of the ICT workforce in Windsor-Essex.

The Opportunity: Increased reach-out by industry.

When students were asked to name local ICT companies and their projects, students typically could only name one or two. If students were more aware of local opportunities, this could help increase retention. In this vein, Workforce WindsorEssex recently released industry videos geared toward students and jobseekers, which can be found at <https://www.workforcewindsoressex.com/meet-tech/>. Additionally, increased partnerships between education and employers and additional experiential learning opportunities will help to further develop this local industry recognition by students.

4. *The Challenge: Windsor-Essex has a male-dominated workforce.*

Windsor-Essex, like other regions, has not succeeded in engaging enough women in the ICT industry. Only 21% of the workforce was female in 2016.¹⁶ Ensuring young women see themselves in the tech industry lets them know they are welcome in future careers, and women can help fill the gap in the available workforce. Additionally, gender diversity brings more perspectives to projects and helps companies reflect their community, which in turn can attract talent who recognize a welcoming employer.

The Opportunity: Engage with females and challenge traditional workforce practices.

Young women can be exposed to career opportunities in ICT through programming in schools, whether they are encouraged to join a robotics team or whether mandatory technology curriculum is adopted by schools. This will also help them have confidence in their knowledge before they enter post-secondary, where they may be one of only a few girls in an ICT classroom, which can be intimidating. They can also learn about opportunities directly from women who are already in the industry through events like Build a Dream, which has been held annually in Windsor-Essex since 2013. In the workforce, employers can foster a diverse workplace by recognizing that hiring practices based strictly on merit can result in a homogeneous-looking workforce. They can also foster an environment where women are given the opportunity to lead and feel comfortable sharing opinions and perspectives.

5. *The Challenge: Some ICT talent has already left the region, making it difficult for employers to fill positions.*

Between 2010 and 2015, Windsor-Essex experienced a net migration of -2,760 people ages 18 to 44 years old, which can be considered the prime working-age population.¹⁷ While of course not all of those who left would have had a background in ICT, we know from carrying out consultations and surveys that at least some were in the ICT field. Additionally,

¹⁶ Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016295.

¹⁷ Statistics Canada, Taxfiler.

employers have indicated they often have few or no applicants to positions, which may also be related to talent leaving the area.

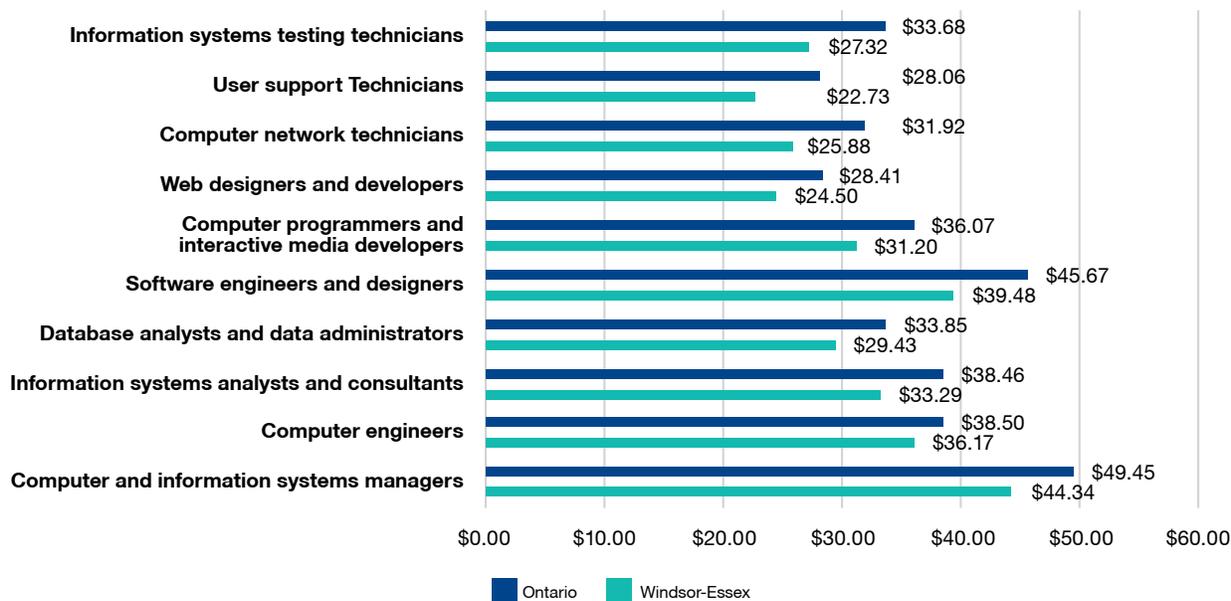
The Opportunity: Create an attraction campaign to bring talent back and attract others.

Currently, there is no central website or resource to attract people to relocate to Windsor-Essex. A website and attraction campaign highlighting the benefits of living and working in Windsor-Essex, such as the low cost of housing and the short commute times, could be used as a tool to increase the availability of an ICT workforce in Windsor-Essex. A quick “moving to Windsor” Google search shows the interest in knowing the benefits of living in Windsor. Developing this resource could be a joint effort between municipalities, economic development, workforce development, tourism, and others.

6. The Challenge: Paying a competitive wage, especially to intermediate and senior talent.

Students and workers consistently ranked competitive wage as an item that is most important to them in the workplace. They also made suggestions related to higher wages when asked about improving the ICT environment in Windsor-Essex. As can be seen in the chart below, Windsor-Essex companies pay, on average, \$4.97 less to those employed in ICT occupations than companies across Ontario.¹⁸

2016 Windsor-Essex vs. Ontario Median Wage¹⁸



The Opportunity: Educate local businesses to show them the value of ICT.

During the ICT Leadership Table discussions held by Workforce WindsorEssex with employers, educators, students, workers, and community organizations involved in ICT, there was general agreement that many local businesses do not value ICT, and this results in work being done for a lower than average price for local businesses. This in turn affects employers’ ability to pay their employees a competitive wage. The ICT Leadership Table suggested a guide be developed to help businesses choose ICT services effectively and realize the value to their business.

7. *The Challenge: Employers believe the skills taught in post-secondary institutions are outdated.*

70% of employers do not believe local post-secondary institutions are adequately preparing students for the roles they have available. They want to see existing curriculum taught more in-depth, as well as education for coding languages such as PHP and JavaScript and frameworks like Bootstrap, Laravel, and PhoneGap.

The Opportunity: Hold curriculum consultations with employers on a biannual basis.

Currently, curriculum consultations with employers are not in place for some programs or only occur once a year. In the ever-changing ICT industry, curriculum consultations need to occur at least twice a year. While entire courses may not be able to be added, changed, or removed quickly, individual professors can incorporate new frameworks, languages, and tools into their classes to ensure students are at least familiar with the technology being used by employers.

8. *The Challenge: Employers find recent graduates lack soft skills and technical skills.*

Employers consistently indicate that it can be difficult to hire recent graduates as they do not have the right soft skills and technical skills for the positions they are hiring for. Employers want to see graduates have the ability to problem solve, communicate with clients, think critically, make presentations, and manage projects while also knowing how to code in multiple languages and use a variety of frameworks effectively.

The Opportunity: Employer-designed training for students and/or recent graduates to complement formal education.

Local employers have expressed interest in creating a talent accelerator for students and/or recent graduates. Participants could complete employer-designed assignments as well as undergo soft skills workshops, garnering them an employer-approved portfolio. Employers could then hire participants directly from the accelerator, knowing participants have the particular skills they are looking for. At the time of writing this report, Workforce WindsorEssex was preparing to host exploratory discussions related to this concept.



WHY DOES THIS MATTER TO WINDSOR-ESSEX?

Windsor-Essex has a small but stable ICT workforce. However, in an economy where technology can often be the deciding factor in a business' ability to remain competitive, a stable workforce needs to become a growing workforce.

Here are 3 reasons having an available, stable, and growing ICT workforce matters to Windsor-Essex.

1. *ICT drives economic growth.*

In 2015, the ICT sector contributed \$71.6 billion to Canada's gross domestic product (GDP).¹⁹ If Windsor-Essex wants to benefit from the contributions ICT can make to the local economy, there must be a workforce available to spur growth in the sector locally. If the workforce is available, the ICT sector can grow, and profits can be invested into the community.

2. *ICT jobs are good jobs, and they're relatively safe from automation.*

ICT occupations pay a median of \$36.41/hour in Ontario. Considering the median wage in Ontario for all occupations is \$26.88, ICT occupations can be considered well-paying.²⁰ Additionally, ICT workers are generally satisfied with their jobs, striking a good work-life balance and taking pride in their work.²¹ Furthermore, in 2013, Oxford University carried out a study on automation, determining the probability of automation for 702 occupations. Computer occupations had an average probability of automation of 17.56%, while over 500 of the 702 occupations examined had a probability of 20% or higher, with most falling between 80%-100% probability of automation.²² The working conditions of ICT occupations combined with the low probability of automation makes ICT occupations highly desirable for Windsor-Essex. Attracting and retaining ICT talent can only spur additional growth in ICT occupations.

3. *ICT drives innovation, which in turn drives competitiveness.*

The ICT sector spent \$4.5 billion on research and development (R&D) in 2015. Additionally, in 2014, 57.1% of ICT businesses in Canada introduced a product innovation, 32.9% introduced a process innovation, and 28.8% introduced an organizational innovation. ICT firms were the leaders in product and organizational innovation, being outpaced only by manufacturing in process innovation.²³ In the global marketplace, it is extremely important for firms to be continuously innovating to remain competitive. Having an ICT workforce that can drive innovation, whether through working for ICT companies that partner with other industries to develop innovative products and services, or whether through direct employment in other industries, will ensure Windsor-Essex remains competitive in all sectors.

¹⁹ Creig Lamb and Matthew Seddon, "The State of Canada's Tech Sector, 2016," Brookfield Institute, July 2016, 18, <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.

²⁰ Emsi Analyst, 2017.3

²¹ "Survey Says IT Worker Stress Way Down, Pride Up," IT Business Edge, accessed February 8, 2018, <https://www.itbusinessedge.com/slideshows/survey-says-it-worker-stress-way-down-pride-up.html>.

²² Carl Benedikt Frey and Michael Osborne, "The Future of Employment," Oxford Martin Programme, 61-77, <https://www.oxfordmartin.ox.ac.uk/downloads/academic/future-of-employment.pdf>.

²³ Creig Lamb and Matthew Seddon, "The State of Canada's Tech Sector, 2016," Brookfield Institute, July 2016, 27-31, <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.

WHAT DOES THE FUTURE LOOK LIKE?

As ICT continues to evolve and experience constant change, Windsor-Essex will need to be prepared to meet the demand for an available, stable, and capable ICT workforce. This will require work on the part of all stakeholders, including employers, educators, students, workers, local government, and community organizations. There are a few themes we can consider now to ensure we are prepared for the future.

THE WORKPLACE

In ICT, a field in which most workers are able to be as mobile as they'd like in their careers and in which competition for talent is global, it is crucial that organizations employing ICT workers in Windsor-Essex ensure they can compete globally for talent. This means employers must offer what workers want, including competitive wages, interesting projects, flexible hours, working-from-anywhere arrangements, unique and comprehensive benefits packages, career planning, and comradery-building opportunities within and outside of the office. If an employer is missing even one of these items, it can make them less attractive to the best talent that has the choice to work almost anywhere. As a community, we need to showcase and celebrate our best ICT employers to ensure local talent stays in the area and to attract new talent to Windsor-Essex.

SKILLS OF TOMORROW

The skills we discuss today will evolve along with the industry. We need to consider what the skills of tomorrow are and think about whether students and workers have these skills.

In January 2018, the MaRS Discovery District concluded a report on the importance of talent to technology, indicating future technology workers need a “mindset for growth”, and listing 6 skills that accompany this mindset:

1. The ability to **work cross-functionally** across teams.
2. The ability to **work with risk** in complex environments.
3. An orientation toward **lifelong learning** and curiosity to take on different roles.
4. A demonstrated **entrepreneurial spirit** to tackle challenges with novel approaches.
5. A **high tolerance** for navigating in ambiguity and uncertainty.
6. An **intellectual humility**, or the ability to evaluate critically one's own ideas and beliefs as well as those of others.²⁴

Are current classroom environments promoting these skills? Are workplaces encouraging professional development that teaches and furthers these abilities? A competitive future ICT workforce will be made up of those who have mindsets for growth, and this mindset must be fostered in our local ICT landscape.

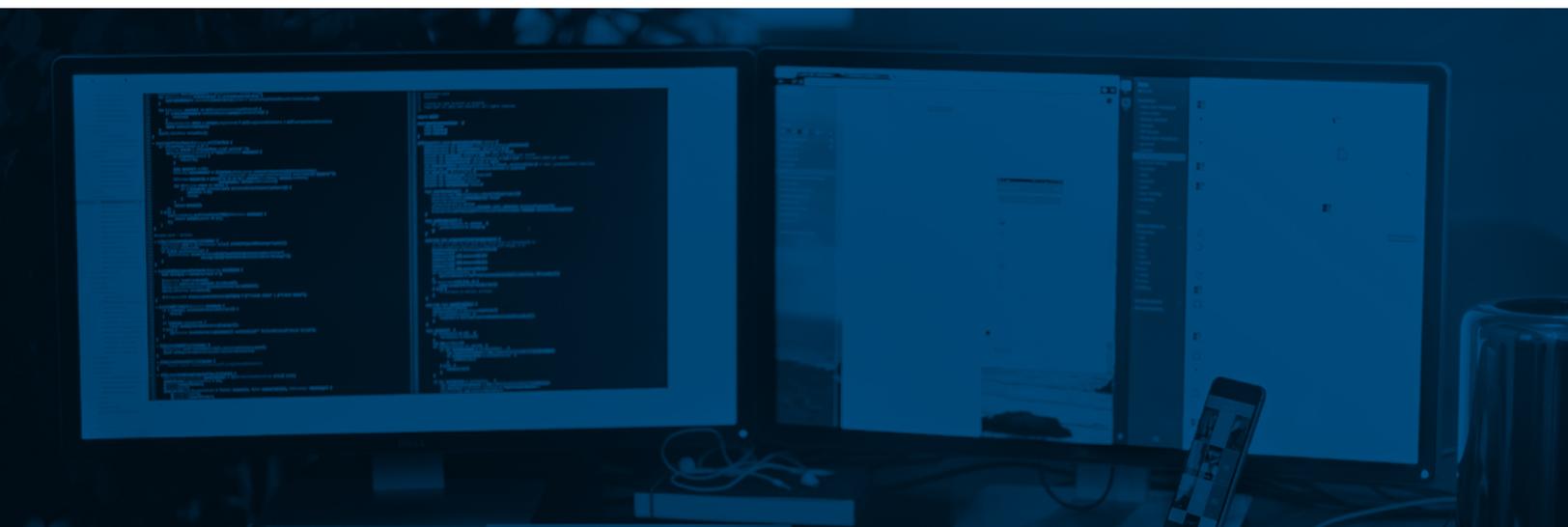
EMERGING OCCUPATIONS

In Windsor-Essex, we're well aware of traditional ICT occupations such as Web Developers, Mobile App Developers, Network Technicians, and Systems Analysts. However, we are just starting to recognize other emerging fields in ICT. These fields are wide-ranging, and can include the following: big data, user experience design, machine learning, deep learning, autonomous

²⁴ Lekan Olawoye, Melissa Pogue, Danton Sück, and Gina Uppal, “Talent Fuels Tech,” MaRS Discovery District, 17, https://studioy.marsdd.com/wp-content/uploads/2018/01/Talent_Fuels_Tech_Report.pdf.

technology, virtual reality, artificial intelligence, and cybersecurity.

When we examine the current curriculum at our local educational institutions, we may see some of these fields touched upon in ICT courses, but many of these fields require dedicated degrees or certificates that do not yet exist. Gaps can currently be filled by students and workers who pursue online study through platforms like Udacity, EdX, Coursera, and others, but Windsor-Essex has the opportunity to produce talent locally by offering courses, certificates, and degrees for the newest fields and most current technology; otherwise, local talent may leave to pursue this education and opportunities elsewhere. Businesses also have a role to play in promoting new fields, as their innovation and early adoption of new ways of thinking can further spur the demand for local education in these fields. In turn, engaging these fields will also drive their competitiveness in the ICT landscape.



CONCLUSION

In sum, the opportunity to improve the ICT workforce environment lies in increased student-industry engagement, furthering engagement with females, attracting talent to the region, educating local businesses on the value of ICT, and increased educator-industry engagement. If the availability and stability of a qualified ICT workforce in Windsor-Essex is strengthened, Windsor-Essex will see increased economic growth, stable jobs, and competitiveness supported by innovation.

As stakeholders look to implement the recommendations made in this report, they should not lose sight of the future of ICT and should take into account the workplaces needed to attract and retain ICT talent, the skills a capable ICT workforce will need, and the emerging occupations the region can integrate into businesses to drive innovation.

By working together, stakeholders can create a more available, stable, and growing ICT workforce in Windsor-Essex.

ADDITIONAL RESOURCES

Some of the following resources may be helpful to you if you are looking to implement or follow up on some of the ideas mentioned in this report:

1. **Build a Dream:** This event is a great opportunity to connect with and inspire young women who may be part of your future workforce.
<http://www.webuildadream.com/>
2. **Data Request:** If you are looking for data to support an application or inform your workforce planning, you can fill out a data request form on our website.
<https://www.workforcewindsoressex.com/data-request/>
3. **Experiential Learning:** You can connect with resources and learn more about local experiential learning opportunities through our experiential learning hub.
<https://www.workforcewindsoressex.com/experiential-learning-hub/>
4. **Explore Tech in Windsor-Essex:** This online hub is an excellent starting point in getting connected to resources that can help you in recruiting, growing, learning and networking tech. This is also where you can access the Tech Spotlight videos that have been released as part of this initiative.
<https://www.workforcewindsoressex.com/tech-sector/>
5. **WEjobs:** If you are looking for a job or are hoping to further the reach of your job postings in the community, WEjobs may be the resource for you! Job posting lists are shared with over 1,000 job seekers and employment counsellors in our region. If you are a job seeker, this is an excellent way to see what types of jobs are available in our region.
<https://www.workforcewindsoressex.com/recruit-tech/>
6. **WEsearch:** WEsearch is a wayfinding tool that can help connect you with potential grants and services within our community.
<https://www.workforcewindsoressex.com/wesearch/?ss=1518195353>

BIBLIOGRAPHY

Emsi Analyst, 2017.3.

Frey, Carl Benedikt and Michael Osborne. "The Future of Employment." Oxford Martin Programme. <https://www.oxfordmartin.ox.ac.uk/downloads/academic/future-of-employment.pdf>.

Lamb, Creig and Matthew Seddon. "The State of Canada's Tech Sector, 2016." Brookfield Institute. July 2016. <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.

Olawoye, Lekan, Melissa Pogue, Danton Sück, and Gina Uppal. "Talent Fuels Tech." MaRS Discovery District. https://studioy.marsdd.com/wp-content/uploads/2018/01/Talent_Fuels_Tech_Report.pdf.

Statistics Canada. 2011 National Household Survey. Statistics Canada Catalogue no. 99-012-X2011033.

Statistics Canada. 2016 Census of Population. Statistics Canada Catalogue no. 98-400-X2016295.

"Survey Says IT Worker Stress Way Down, Pride Up." IT Business Edge. Accessed February 8, 2018. <https://www.itbusinessedge.com/slideshows/survey-says-it-worker-stress-way-down-pride-up.html>.

workforce
WindsorEssex



880 North Service Rd
Unit 201
Windsor, ON
N8X 3J5

Ph: 226-674-3220

E-mail: info@workforcewindsoressex.com

WORKFORCEWINDSORESSEX.COM