

# ALGOMA ICT

## WORKFORCE SURVEY

Spring 2024



**AWIC** **ALGOMA WORKFORCE**  
INVESTMENT CORPORATION

SAULT STE. MARIE  
**INNOVATION**  
CENTRE

# ALGOMA ICT WORKFORCE SURVEY 2024

## About the Survey

### Survey Participants

The survey was conducted over 3 months between November 2023 and January 2024.

59 ICT (Information and Communication Technology) employers provided feedback on a range of workforce issues including projected vacancies, hiring, recruitment strategies and challenges, as well as perspectives on candidate skills, education, and training.

This is a follow-up survey that was previously conducted in 2017 and 2021.

Respondents indicated the following:

- 81% of the employer's head offices are in Algoma.
- 14% indicated they are categorized under Healthcare and Social Assistance and another 14% were categorized under Professional, Scientific and Technical Services.
- 10% were categorized under Information and Technology, followed by 10% Arts Entertainment and Recreation, 10% Agriculture and 10% Manufacturing.
- The participating employers employ approximately 195 people in ICT roles (2,175 people in total).
- 82% employed 50 or fewer people.
- 11% employed between 50 and 150 people.
- 7% employed over 150 people.

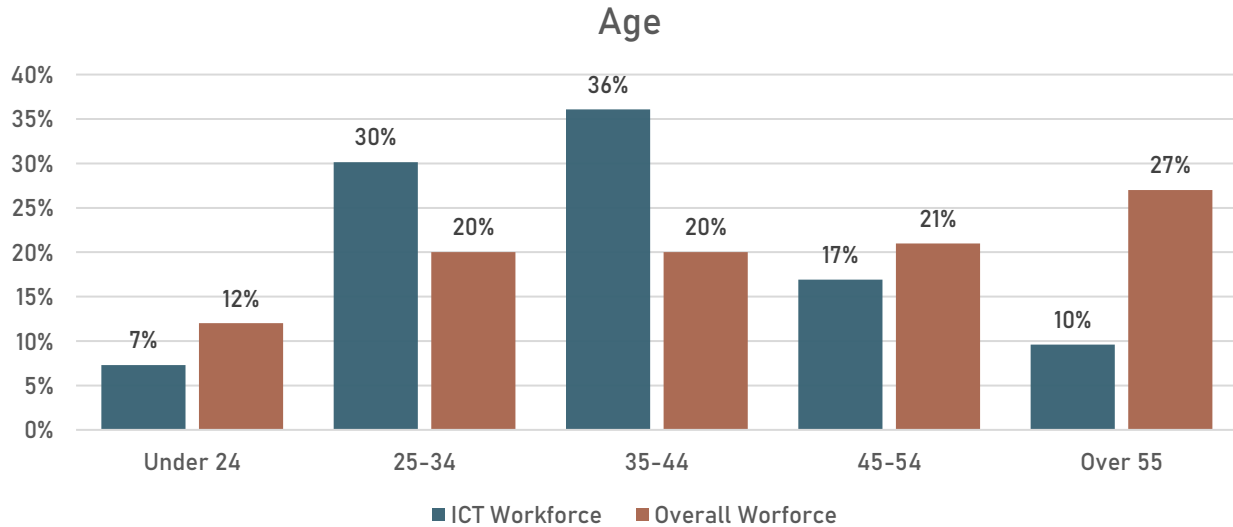
### Limitations

- Not all respondents answered all the questions. Some of the questions were not required.
- Not all ICT employers in the region participated in the survey.
- Results, as reported, should be seen as a sampling of employer views rather than comprehensive.
- Tech-sector job titles and terminology, as expressed by employers, are not necessarily consistent with the National Occupation Classification (NOC) codes used by the government creating additional challenges when gathering and analyzing the data.

## Existing Workforce

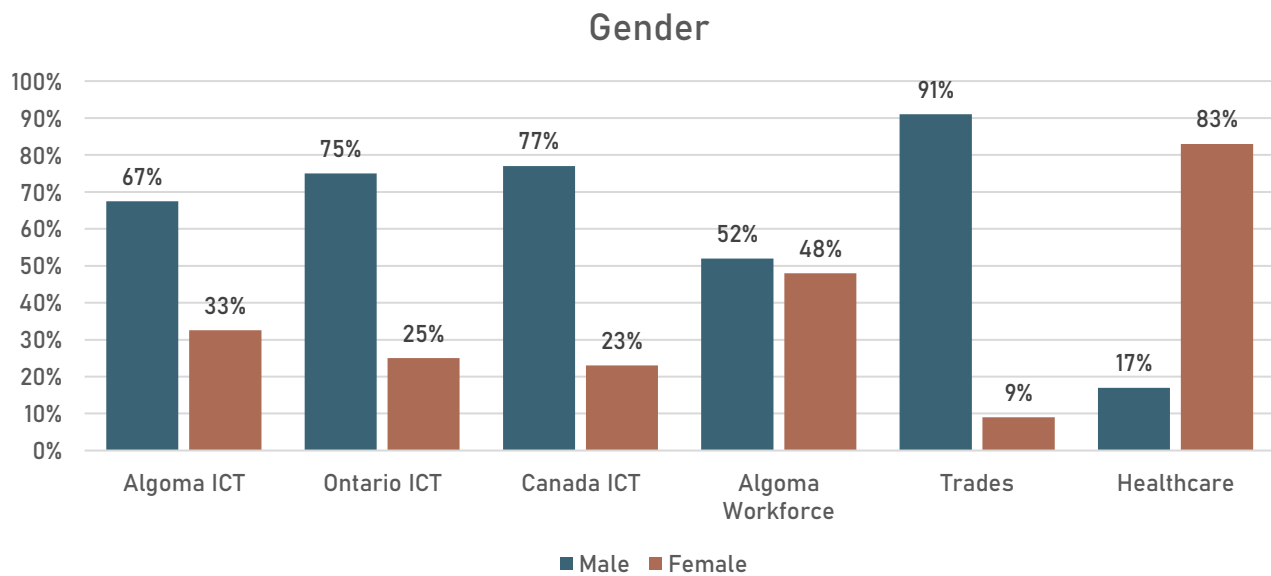
The employers who participated in the survey employ approximately 2,175 individuals. Of those individuals employed, approximately 195 specifically work in ICT roles in Algoma.

The age of the ICT workforce tends to be younger than the overall workforce. 73% of the ICT workforce is under the age of 44 compared to 52% of the overall workforce.



Source: Statistics Canada. (2023). Labour force status by age and gender: Canada, provinces and territories, census divisions and census subdivisions - 25% Sample Data Table 98-10-0485-01

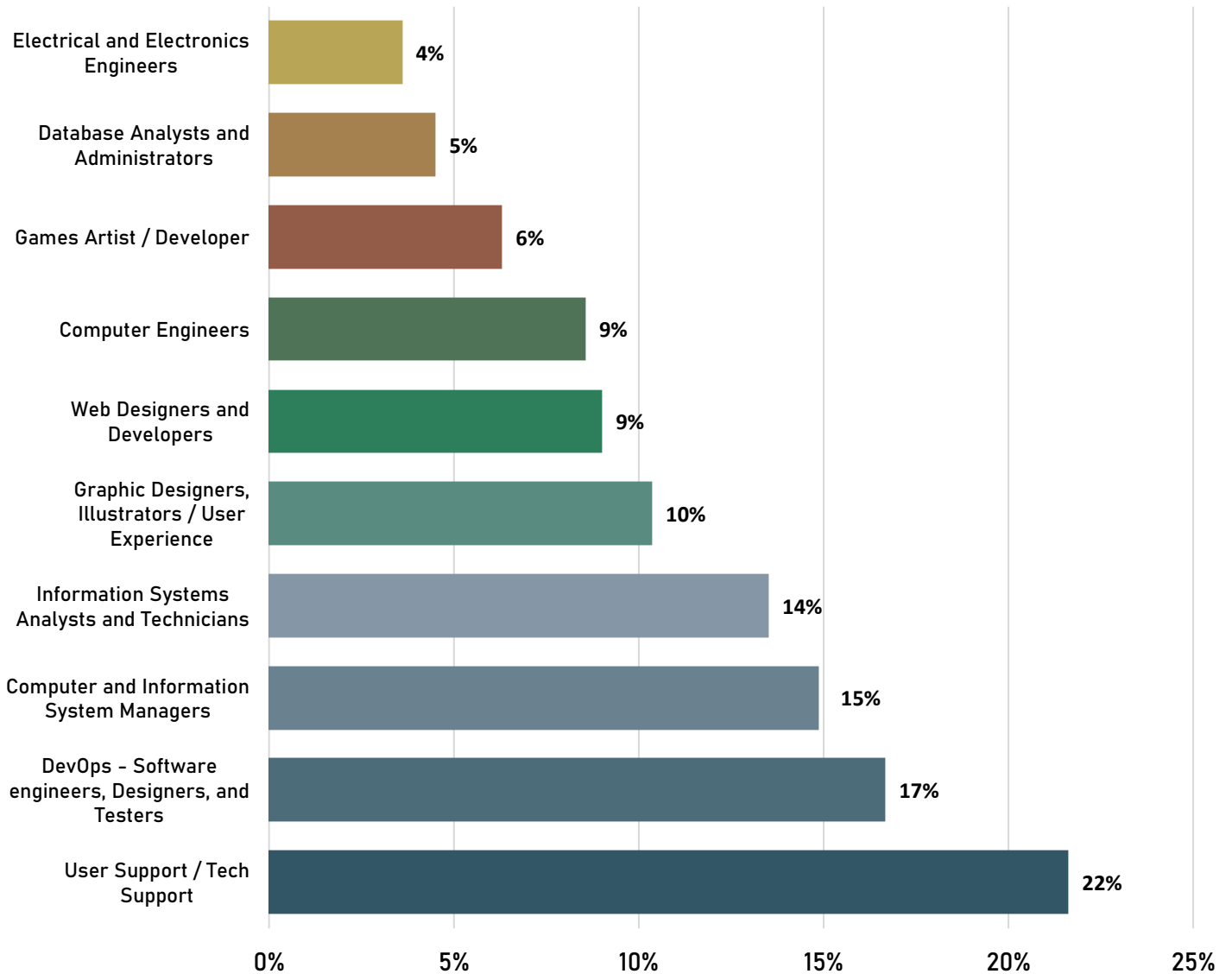
Overall, females make up 48% of the workforce in Algoma. As for gender distribution of ICT employees, the sector is 67% male and 33% female. As a comparator, the 2021 Census<sup>3</sup> report stated that 25% of the ICT workforce in Ontario and 23% of the ICT workforce in Canada was female. The Construction and Healthcare sectors in Sault Ste. Marie is shown to highlight both ends of the spectrum of gender distribution.



Source: Statistics Canada. (2021). Population and dwelling counts, for Canada, provinces and territories, 2021 Census - 100% data. Table 98-316-X2021001.

Employers were asked to list the number of people whose primary function aligns with various primary roles. 222 employees were categorized under the following primary roles:

### PRIMARY ROLE



## Forecasting Hiring Needs and Skills in Demand

When employers were asked if they plan to hire in the next 12-24 months, of the positions planned for hire, 60% were classified as full-time. The employers provided the following details on their future hiring plans:

- 33 Full-time positions.
- 9 Part-time positions.
- 12 Contract positions.
- 1 employer selected Other.

Participating employers reported that the main reason for new hires was due to expansion and growth (58%), retirements/succession (13%) and technological change (10%).

Employers were asked to list the top 3 ICT jobs currently in demand at their organization. Based on their responses, a weighted average was created to rank the top 21 jobs in demand.

Rank #	Job
1	Helpdesk Support Tech
2	Web Developer
2	Network Technician
4	Marketing
5	Graphic Designer
6	Software Developer
7	Electronics
8	System Administrator
8	Cybersecurity
10	3D Artists
11	DevOps
11	Engineer
11	Sales
14	Broadcast Technician
14	Clinical Advisor
14	Game Programmer
14	Geographic Information Systems
14	Year-Round Hydroponics Technician
19	Project Managers
19	Sport Analyst
21	Data Management

*Points were calculated based on a weighted average of each survey response since they picked 3 answers (#1 \*3 + #2\*2 + #1). Repeated numbers represent 2 or more options that tie in points.*

## Technical Skills in Demand

We presented employers with a list of technical skills to identify which ones they prioritize in the hiring process. From the options we provided, the employers selected the skills they required. The table below has been ranked from highest to lowest need.

Current Skills in Demand	% of Responses
Cloud Technology	92%
Networking	85%
SQL	73%
Cybersecurity	69%
Azure	65%
HTML	58%
Automation	50%
JavaScript	46%
API	38%
Python	35%
AWS	35%
CSS	27%
C++ Programming	27%
C#	23%
Machine Learning / Artificial Intelligence	23%
NET Framework	23%
React	15%
Java	15%
Angular	15%
Docker	12%
C	8%
Java/J2EE	4%
jQuery	4%

Employers were asked to forecast what technology areas or skill sets they foresee as having the most potential growth in 3 to 5 years.

Future Skills in Demand	% of Responses
DevOps (Software Development & IT Operations)	54%
Cybersecurity	54%
Full-Stack Web Development	42%
Front-End Web Development	42%
User Interface / User Experience	42%
Machine Learning / Artificial Intelligence	42%
Data Science / Big Data	27%
Back-End Web Development	23%
Programming Languages	15%
Agile Development	12%

*Blockchain and Value stream mapping were options but they both scored 0%.*



## 10 Critical Technical Skills for Select ICT Occupations Identified by ICTC

Based on the positions employers picked for current and future demand, we created a list of the skills that are necessary for these positions. This information was taken from the following report: [Canada's Growth Currency: Digital Talent Outlook 2023](#). Information and Communications Technology Council (ICTC) – October 2019.<sup>1</sup>

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### *IT Support Specialist*

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- Expert use of Excel
- Proficiency with SQL
- Proficiency with ITIL practices
- Deep knowledge of virtual private
- Networks (VPN)
- Familiarity with DNS
- Familiarity with programming languages like C++
- Familiarity with protocols used on IP networks like DHCP
- Proficiency with SharePoint

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### *Full Stack Developer*

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- Proficiency with JavaScript
- Proficiency with HTML
- Proficiency with CSS
- Ability to use cloud platforms like AWS
- Proficiency with SQL
- Proficiency with Python
- Proficiency with Java
- Proficiency with PHP
- Ability to work with and create APIs
- Ability to work with open-source platforms like NodeJS

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### *Database Administrator*

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- Proficiency with SQL
- Ability to use cloud platforms like AWS
- Familiarity with creating permissions and guidelines to ensure access is appropriately assigned
- Experience planning and developing databases
- Experience cleaning and tagging data correctly
- Experience with creating procedures to minimize system downtime

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### *Digital Marketer*

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- Proficiency with social media and SEO
- Proficiency with analytics tools such as Google Analytics
- Proficiency with Photoshop
- Proficiency in writing
- Experience in creating marketing campaigns
- Experience with defining goals and determining target audiences
- Proficiency with ads tools like Google Ads

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### *Software Developer*

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- Proficiency with Java
- Proficiency with SQL
- Proficiency with Python
- Proficiency with CSS
- Proficiency with JavaScript
- Ability to work with and create APIs
- Proficiency with HTML
- Ability to use cloud platforms like AWS
- Proficiency with C/C++
- Proficiency with open-source version control platforms like Git

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### *DevOps Engineer*

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- Extensive experience with continuous integrations
- Proficiency with Java
- Proficiency with SQL
- Ability to use cloud platforms like AWS
- Proficiency with open-source automation software like Jenkins
- Proficiency with container management tools like Docker
- Ability to work with and create APIs
- Proficiency with open-source container orchestration systems like Kubernetes
- Familiarity with open-source deployment tools like Ansible
- Proficiency with automation products for software infrastructure like Puppet

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### *Cybersecurity Analyst*

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- Familiarity with cybersecurity standards
- Experience with operating systems such as Linux
- Experience with IP networks
- Experience with DNS
- Experience with proxy servers
- Ability to conduct vulnerability and penetration tests
- Ability to conduct risk analysis
- Ability to perform security audits
- Proficient in analyzing security breaches and identifying causes of attacks

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### *UX/UI Designer*

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- Proficiency with JavaScript
- Proficiency with HTML
- Ability to work with and create APIs
- Expert use of InDesign
- Ability to work with open-source front-end web frameworks like AngularJS
- Expert use of design toolkits like Sketch
- Proficiency with open-source version control platforms like Git
- Familiarity with JavaScript libraries like jQuery
- Familiarity with product design platforms like InVision



## Soft Skills in Demand

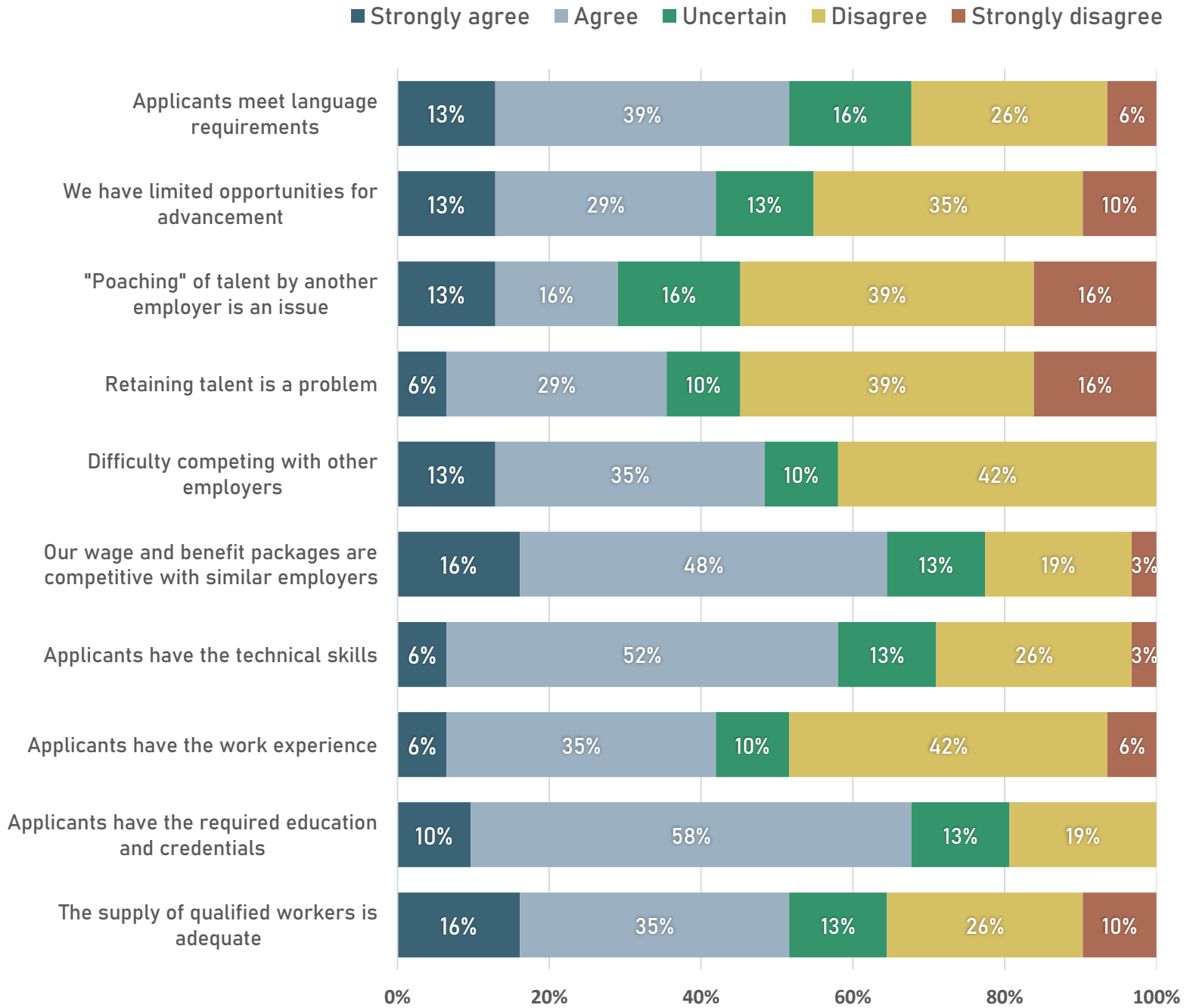
Employers picked from a provided list and indicated which soft skills are the most important for their ICT employees to have. Results were ordered as follows:

Rank #	Soft Skills in Demand
1	Teamwork/interpersonal skills
2	Problem solving/reasoning/creativity
3	Analytical/research skills
4	Work ethic, dedication & dependability
5	Communication
6	Self-motivation/independence
7	Willingness to learn
8	Ability to follow instructions
9	Time management and/or organizational skills
10	Professionalism

# Supply of Talent/ Qualified Workers

## Supply of Local Talent

Employers were presented with the following statements and asked to pick 1 of 5 options to represent their level of agreement with each statement based on their experience with the recruitment and hiring of their ICT workforce.



## Hiring Graduates

Of the employers who hired local graduates:

- 63% have hired Algoma University graduates.
- 50% have hired Sault College graduates.
- 0% have hired Lake Superior State University graduates.
- 19% have hired graduates from other colleges and universities.

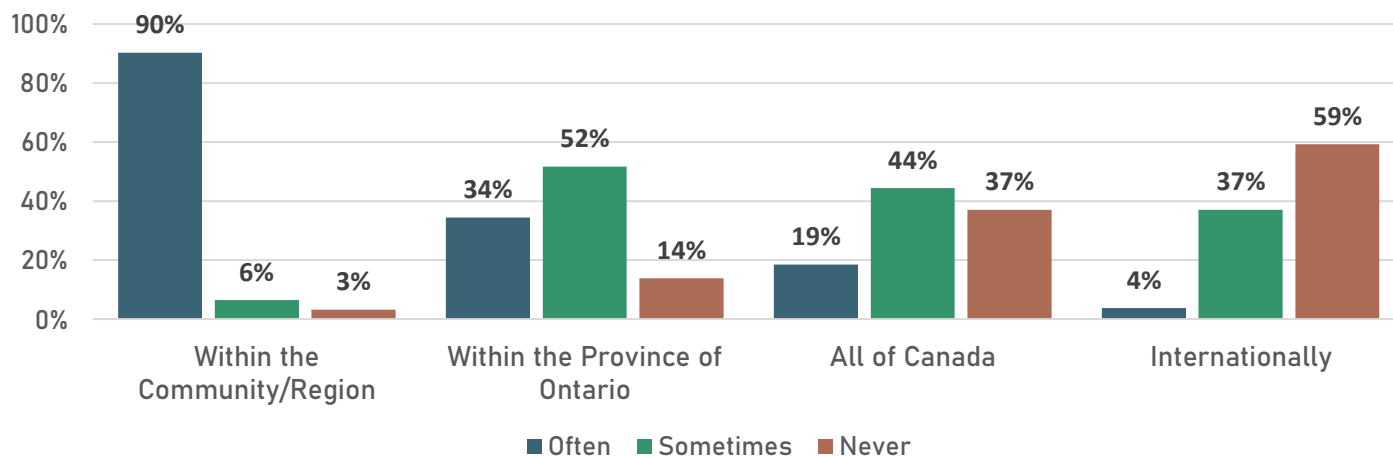
Employers were asked to rate the recent graduates:

- 50% rated them Good.
- 42% rated them Excellent.
- 8% rated them Fair.

## Talent Acquisition

Most employers indicated they *Often* recruit within the community/region, *Sometimes* within all of Canada, and *Sometimes* or *Never* recruit Internationally. These results can be seen in the chart below.

### Hiring by Region



Employers were asked if they allow for full-time remote working when they recruit ICT employees, and the responses were as follows:

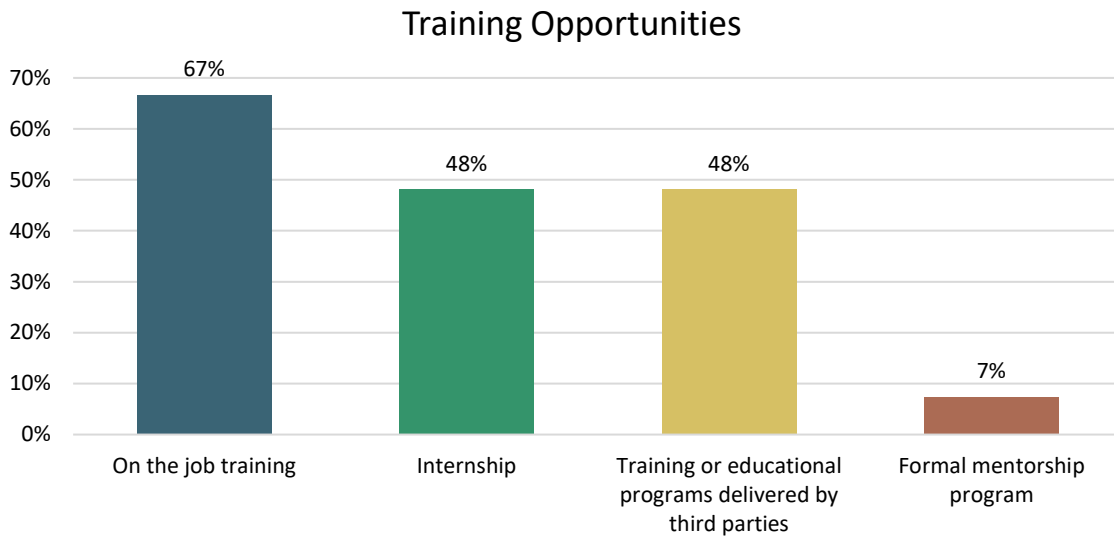
- 74% reported No.
- 26% reported Yes.

If the employer answered Yes, some responses indicated they recruit within Canada (mainly Ontario) as well as internationally. If the employer answered No, some reasons for preventing full-time remote workers include:

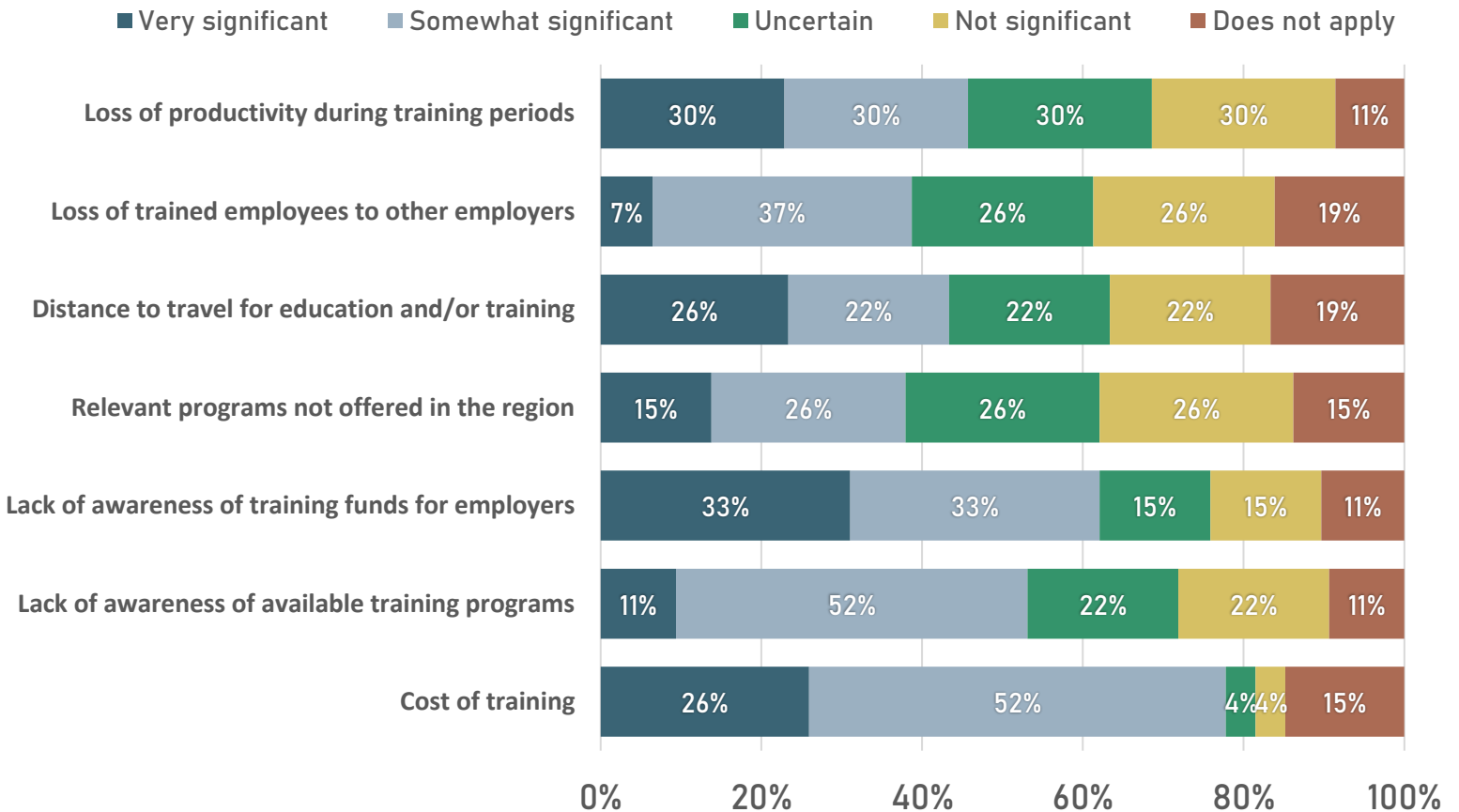
- Employees need to be onsite for the service offered.
- Currently working on the company infrastructure to enable more remote work.
- Current schedule allows for some remote days but not full-time.

## Training/Work-Integrated Learning

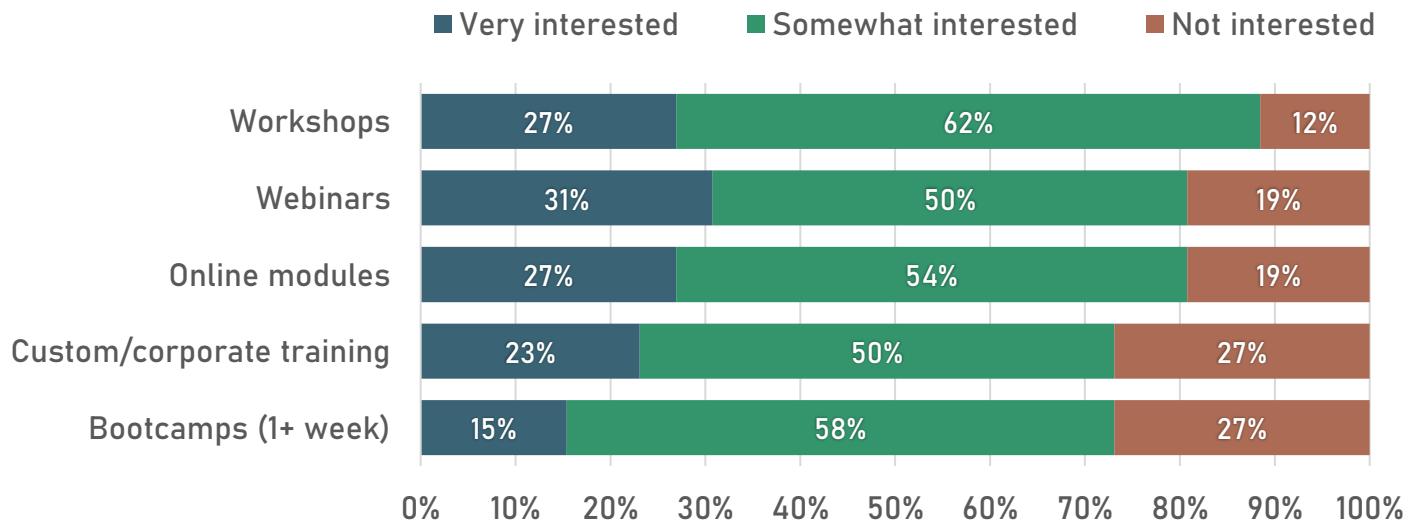
Employers were asked if, in the last 12 months, their business directly provided or financially supported any of the following education and/or training opportunities to their ICT workforce. The graph shows the percentage of employers who confirmed they provided or supported these training opportunities.



Employers were asked to what degree the following factors presented a challenge when providing training and/or educational opportunities for their ICT workforce.



Employers were also asked about future training opportunities and how interested they would be in the following formats for training and/or skill development.



# Thoughts for the Future

## Opportunities for the ICT Industry

Employers responded to what they expect to see as the top 3 opportunities for growth over the next 2-5 years in the ICT/Technology industry. A weighted average of each survey response was used to rank the top responses in order.

Ranks #	Opportunities
1	Cybersecurity
2	Artificial Intelligence
3	Web Development (Web and Software)
5	Automation
5	DevOps
6	Cloud
11	Data Analysis
11	Customer Experience
11	Information Communications and Technology
11	E-Commerce
11	Social Media
14	Gaming
14	Data Science
14	Design
17	3D Modelling
17	Communications

*Points were calculated based on a weighted average of each survey response since they picked 3 answers (#1 \*3 + #2\*2 + #1). Repeated numbers represent 2 or more options that tie in points.*

## Threats to the ICT Industry

Employers were asked what they expect the top 3 issues/challenges in the ICT/Technology industry to be over the next 2-5 years. A weighted average of each survey response was used to rank the top responses in order.

Rank #	Industry Issues
1	Workforce Skill Gaps
2	Operational Costs & Wages
3	Cybersecurity
4	Artificial Intelligence
6	Economic Uncertainty
6	Staff Recruiting
7	Retaining Talent
12	Simplification
12	RTO Mandates
12	Environmental Factors
12	Training
12	Data Management

*Points were calculated based on a weighted average of each survey response since they picked 3 answers (#1 \*3 + #2\*2 + #1), Repeated numbers represent 2 or more options that tied in points.*



## Threats to the ICT Industry in Algoma

Employers were also asked what they expect the top 3 issues/challenges in the ICT/Technology industry in *Algoma* to be over the next 2-5 years. A weighted average of each survey response was used to rank the top responses in order.

Rank #	Workforce Issues in Algoma
1	Quality of Workforce
2	Operational Costs & Wages
3	Employee Retention
4	Larger Companies
5	Cybersecurity
6	Artificial Intelligence
7	Skills Gaps
12	Infrastructure
12	Simplification
12	Community Size
12	Difficult for Start-ups
12	Environmental Factors
14	Managerial Inability
14	Training
15	Marketing/Sales

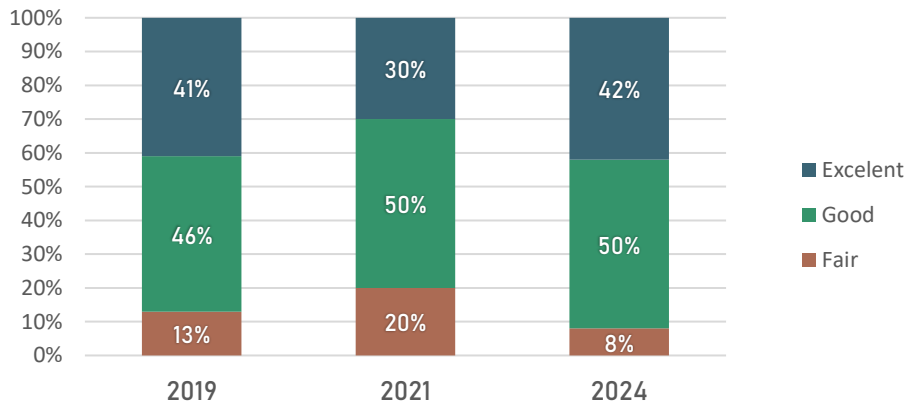
*Points were calculated based on a weighted average of each survey response since they picked 3 answers (#1 \*3 + #2\*2 + #1), Repeated numbers represent 2 or more options that tied in points.*

# Trends & Highlights

## New Talent

This year's survey results were compared with the last survey results from 2021. In the past, 90% of employers had hired from Sault College and 80% had hired from Algoma University, now those values have gone down to 50% and 63% respectively. Employers rated the quality of talent coming from these recent graduate hires (they were rated as either *Fair*, *Good* or *Excellent*). Compared to the last survey employers have been more satisfied with these hires. In the past, 50% of employers rated recent graduates as *Good*, 30% rated them as *Excellent* and 20% rated them as *Fair*. This year, the rating of *Good* remained the same at 50%, whereas the rating of *Excellent* went up to almost 42% and the rating of *Fair* went down to 8%.

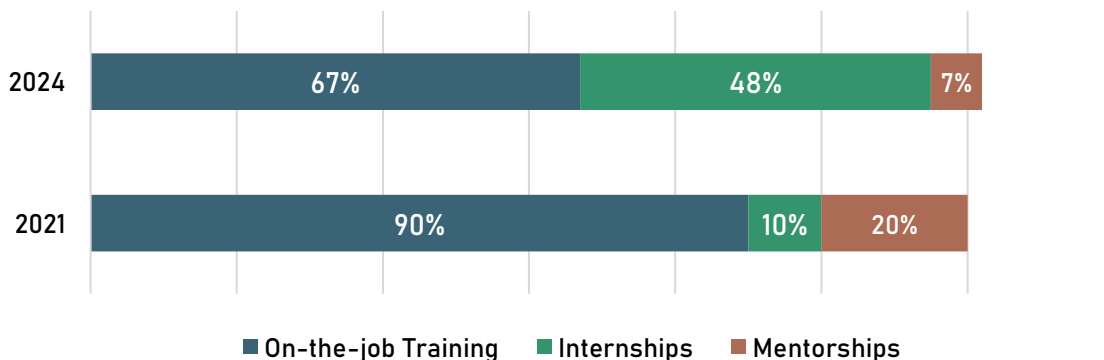
### Recent Graduates Rating by Survey Result



## Training

When comparing the training that employers directly provided or financially supported for their employees in the past 12 months, there was a significant difference from the survey results in 2021. In the past survey, 90% of responding employers provided their employees with on-the-job training, this year only 67% of employers provided their employees with this type of training. The past survey showed that 10% of employers provided or financially supported internships, whereas, on this year's survey this percentage increased to 48%. Finally, another significant difference between the past and current surveys was that the previous results showed that 20% of employers offered formal mentorship programs but now only 7% of employers are offering this type of training opportunity.

### Training Provided by Companies per Survey



## Skills in Demand and Future Skills

When comparing the skills employers believed to be the most important between the previous survey and the most recent survey, there was an increase in Cloud Technology, which was present in almost every response that was received this year. In 2021, Cybersecurity was ranked in 1<sup>st</sup> place but this year it dropped to the 4<sup>th</sup> ranking on the list, even though it was present in more responses. Networking and SQL came in 2<sup>nd</sup> and 3<sup>rd</sup> place respectively, on the previous survey these two results were found in 2<sup>nd</sup> and 3<sup>rd</sup> place as well, but in the reverse order.

Current Demands	
2021	2024
Cybersecurity	Cloud Technology
SQL	Networking
Networking	SQL
Cloud Technology	Cybersecurity
NET Framework	Azure

When employers were asked for their thoughts on future demands in the ICT/Technology industry, responses did not change greatly compared to 3 years ago. DevOps is still regarded as the most important future skill that the market will demand. Cybersecurity and Web Development are now predicted to have more demand in the future as well.

Future Demands	
2021	2024
DevOps (Software Development & IT Operations)	DevOps (Software Development & IT Operations)
User Interface/ User Experience	Cybersecurity
Machine Learning / Artificial Intelligence	Full-Stack Web Development
Cybersecurity	Front-End Web Development
Full-Stack Web Development	User Interface / User Experience

## Industry Issues and Opportunities

The issues surrounding the industry remained very similar to the results from the 2021 survey. On the top of both survey results lists, we have Cost & Wages, Skill Gap, and Training and Recruitment. One issue that is now on top of the charts is Cybersecurity, this explains why it is being selected as one of the top future skills in demand, as well as being chosen as the 1<sup>st</sup> future opportunity for growth in tech. Artificial intelligence also rose to the top of the list of issues in the industry and is ranked in 2<sup>nd</sup> position on the future opportunities for growth in technology (the same position as it was 3 years ago).

Industry Issues	
2021	2024
Sourcing and retaining IT Talent	Operational Costs & Wages
Salaries	Skills Gap
Lack of skilled workforce	Cybersecurity
Finding a skilled workforce	Artificial Intelligence
Remote Work	Economic Uncertainty

## Final Remarks

The technology industry has been growing at an incredible speed and it does not seem like it will slow down anytime soon. In our last survey, ChatGPT was not yet a big topic like it is today, and employers had already recognized the issues and opportunities that this kind of technology could offer.

Overall, our local community has seen improvements in the quality of the workforce being provided. Within this survey, employers shared their future hiring plans, these showed a reduced number of positions being open in the future. This could lead to an increase in local graduates seeking employment opportunities out of town.

## References

1. ICTC, 2019. *Canada's Growth Currency - Digital Talent Outlook 2023*, Information and Communications Technology Council. Canada.(p21-24)
2. Statistics Canada. [Table 98-10-0485-01 Labour force status by age and gender: Canada, provinces and territories, census divisions and census subdivisions](#)
3. Statistics Canada. 2023. (table). *Census Profile*. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023.  
<https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>