Academic employment in the ICT sectors in the Arctic North

– perspectives on segregation, gender equality and diversity and ways forward to more sustainable futures –

Kanako Uzawa, PhD Researcher

Table of Contents

Preface

The project *Academic (Un)employment and Mobility in the Arctic North* is a collaboration between Oulu University in Finland, Luleå University of Technology in Sweden and Arctic University of Norway and took place between 1 August 2018 to 30 September 2020. We would like to thank Interreg Nord, Regional Council of Lapland and Region Norrbotten for their generous financial support and we hope this project will become a platform which initiates further research on the subject. The project's main focus is on areas of Northern Norway, Sweden and Finland (see Figure 1).

While Northern Norway, Sweden and Finland are generally little known in comparison to major cities such as Helsinki, Stockholm and Oslo, there has been increased interest in the potential for economic growth and development that is pronounced within various sectors such as business, tourism and government-related development projects. This affects mobility in the labour market both within and beyond national borders. It also requires certain adaptation by different stakeholders such as governments, employers and employees to re-evaluate work conditions, securities, ethics, diversity and gender equality for more sustainable futures.

The project *Academic (Un)employment and Mobility in the Arctic North* therefore aims to build *knowledge* on these themes, with particular emphasis on Information Communication Technologies (hereafter ICT) sectors in Northern Norway, Sweden and Finland. This report raises the questions of what constitutes diversity types in a workplace and how is gender discussed within ICT sectors? This particular focus on mobility, diversity, gender and digital infrastructure is becoming important in the adaptation process for more sustainable futures: how can employers and employees find a common platform where they can tackle different challenges to adoption, especially for people who work remotely, people with different nationalities and backgrounds, or even people who are unable to work due to uncontrollable situations such as COVID-19 in 2020? This also includes the challenge presented by geographical location in Northern Norway, Sweden and Finland, where households are often very remote.

1 Introduction

In recent years, there has been increased interest in reassessing the links between our livelihoods, sustainable development, climate change, the environment, the landscape and cultural values in the Arctic. This is particularly the case in areas in the Arctic regions where climate change effects can be seen.

Increasing interest in the Arctic regions in business and governmental development projects goes hand in hand with the need for human resources and human capital with high-level ICT skills. One benefit of having people with ICT skills in the vicinity is that it allows both employers and employees to find more adoptable solutions to help them tackle challenges they may face in the workplace. Such challenges may involve communications, work distance, efficiency and so forth. Here, innovative thinking and research can offer new ways of identifying challenges and working towards more sustainable solutions in the workplace. Parallel to an expectation of economic growth in the Arctic regions, this report pays close attention to mobility, diversity and gender in the ICT sectors in Northern Norway, Sweden and Finland. This report contributes to *knowledge* development for the areas of Norway, Sweden and Finland.

This report starts with a very brief description of governmental policies in Norway, Sweden and Finland, and more specifically the northern part of each country. The aim of this is to provide a general overview of the economic, political and cultural landscape of the North. The following section focuses more on the ICT sectors in Norway, Sweden and Finland, with emphasis on mobility, diversity and gender, followed by interview materials conducted by three researchers from Norway, Sweden and Finland.

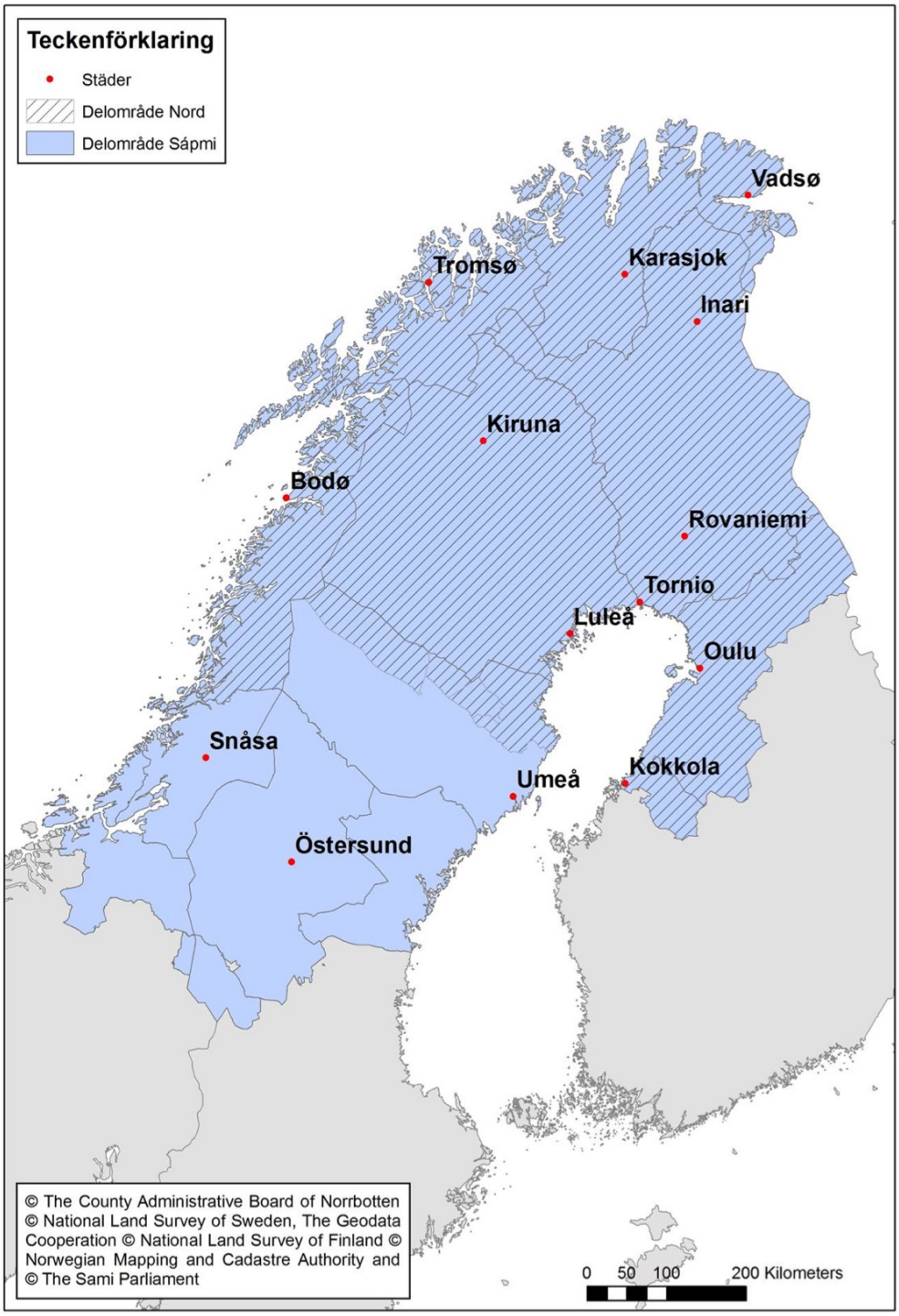


Figure 1 Interreg Nord area

2 Background information on Northern Norway, Sweden and Finland

2.1 Norway

As of 2018, the population of Norway stands at 5,295,619 (Statistics Norway, n.d.-b), with more than 80% of the population residing in urban settlements (Statistics Norway, 2016). Norway is generally at the forefront when it comes to policies relating to human rights and indigenous peoples. This is evident as Norway was the first country in the world to ratify ILO C169, Indigenous and Tribal Peoples Convention, 1989 (No.169) (International Labour Organization, n.d.). Norway also holds rich natural resources, which are based on fisheries or generate petroleum and gas. Furthermore, Norway generally underlines the importance of research into climate change, sustainable development and indigenous peoples in the Arctic region.

When it comes to recent economic development policy in Northern Norway, the Norwegian Ministry of Foreign Affairs sheds light on the importance of the High North in Norway (See Norwegian Ministry of Foreign Affairs, 2009, for your information). Northern Norway has historically played an important role as a trade route passage to the Barents Sea and Russia. In this regard, Northern Norway is considered to be a major asset not only for Norway, but for the world. The government focuses on how to develop Northern Norway in the most sustainable way, creating more economically and socially sustainable futures. A recent example is the Norwegian government's prioritized foreign policy in Northern Norway, *High North Strategy* announced in 2006 (See Norwegina Ministry of Foregin Affairs, 2006, for your information). This was followed by a report in 2009, *New Building Blocks in the North*, which defines areas of priority (Norwegian Ministry of Foreign Affairs, 2009). In 2017, the Norwegian government updated and defined priority for Northern Norway by setting up *Norway's Arctic Strategy*. Areas of its priority cover the range from knowledge and business development to infrastructure, international cooperation and emergency preparedness (Norwegian Ministry, 2017). All these policies and priorities defined by the government suggest a need for change and adaptation among various stakeholders such as employees, employers and locals. How can we attract the workforce and create an ethically healthy work environment? In its *Norway's Arctic Strategy* report, it is stated that 16% of enterprises located in Northern Norway struggle with recruitment; significantly higher than the national average, which stands at 9% (Norwegian Ministry, 2017, p. 6). This Figure indicates the challenge of securing a skilled workforce in Northern Norway. Thus, this shed

light on the importance of creating an adaptable work environment which meets the needs of both employers and employees.

2.2 Sweden

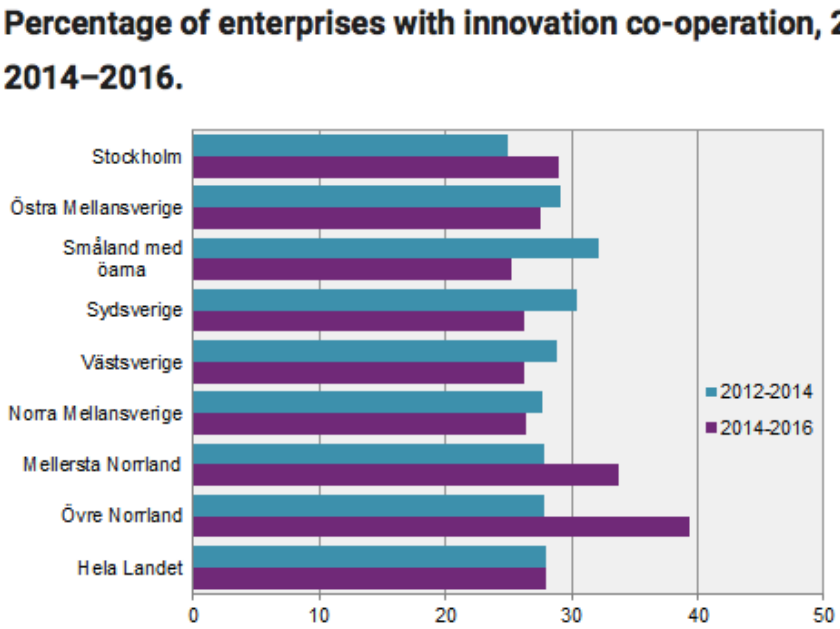
As of 2020, the population of Sweden stands at 10,099,265, and 87.9% of the population live in urban areas (Worldometer, n.d.). Despite the demographic, there are industries located in Northern Sweden with a large number of employees, and these are considered to be an important part of the Swedish economy.

Sweden has vast forests and is rich in minerals, and is generally recognized for its wood engineering industry. The country's economy also depends on mineral extraction and mining. For example, the Kiruna mine owned by Luossavaara-kiirunavaara AB (LKAB), located in the county of Norrbotten in Northern Sweden, is the largest underground iron ore mine in the world and employs about 4000 people (LKAB, n.d.). The Sámi Parliament is also located in Kiruna, representing Sámi culture and people as the indigenous population of Sweden. Sámi land, which is also known as Sápmi or Sameland, extends around and over the northernmost parts of Norway, Sweden, Finland and Russia (Government Offices of Sweden, 2011; Guttorm, 2019). Reindeer herding, fishing, hunting and tourism also play an important part in their economic livelihoods (See also Government Offices of Sweden, 2011).

The government of Sweden takes an approach of understanding climate change as new challenges and opportunities within various public and private sectors such as shipping, energy extraction, fishing, hunting, trading and cross-border development by applying the concept of long-term *sustainable* development to its policies. (See Government Offices of Sweden, 2011, pp. 4 – 6 for your information). In its report *Sweden's strategy for the Arctic region*, the government of Sweden describes how its focus is centralised around three main agendas; sustainable development, climate change and the human dimension. Assessing the effects of climate change suggests changes and adoptions, which also helps to create new work environments and conditions (Government Offices of Sweden, 2011). It is necessary for all stakeholders – government, employers and employees – to be aware of how to understand and adopt these changes, as such changes in policies involve all members of society.

When it comes to innovation activities[1] among enterprises in Sweden, the *Statistics Sweden community innovation survey* indicates that nearly half of all small and medium-sized enterprises were working on innovation activities between 2014 and 2016 (Statistics Sweden, 2018). By regional distribution, Figure 2 shows that enterprises in most of northern Sweden (Övre Norrland) is one of the largest contributors to innovation cooperation (Statistics Sweden, 2018). Such an indicator can be used as a way of reflecting upon the mobility of the workforce and regional development; and furthermore, the needs of those enterprises to achieve their business goals.

Figure 2 Source: Statistics Sweden



2.3 Finland

As of 2020, the population of Finland stands at 5,541,630, and 85% of the population live in and around urban areas (World Population Review, n.d.). Following Norway and Sweden, the government of Finland is also working to deal with challenges presented by global warming and economic activities in the Arctic. This includes placing regional development initiatives under the heading of sustainable development (See Prime Minister's Office Publications Finland, 2013 for your information).

[1] Statistics Sweden describes innovation activities, which includes any companies working on innovation tasks such as development of new products, process innovation, organisational innovation, marketing innovation and so forth (See Statistics Sweden, 2018 for further details).

In 2013, the government of Finland adopted *Finland's strategy for the Arctic Region* with a view to Finland becoming a pioneer of sustainable development in the Arctic (Prime Minister's Office Publications Finland, 2013). This strategy covers a wide range of themes with a view to strengthening Finland's position in the Arctic. These themes are "…the creation of new business opportunities, the Arctic environment and the region's security and stability; the position of the northern parts of Finland; international cooperation; and Arctic expertise in the widest sense of the term" (Prime Minister's Office Publications Finland, 2013, p. 3).

In its report *Finland's strategy for the Arctic Region*, the government of Finland indicates serious measures for dealing with challenges due to climate change, focusing on good quality of life in local communities. This includes working conditions, accessibility of work, effective basic services, security, equality and education, with special emphasis on livelihoods in northern Finland, describing certain challenges such as an ageing population, long distances, the labour market and a lack of resources to deliver government services (See Prime Minister's Office Publications Finland, 2013, p. 20 for your information). This includes Finland's Arctic and human rights policy, which also focuses on the right of the indigenous people, the Sámi, in the region (Prime Minister's Office Publications Finland, 2013).

3 Information and Communications Technology sectors in Norway, Sweden and Finland

This section starts with a general overview of Information and Communications Technology sectors in Norway, Sweden and Finland with emphasis on mobility, diversity and gender. The following section focuses more on each country and interview summaries.

Finland and Sweden are generally known to be leading countries as regards establishment of NMT (Nordic mobile technologies), followed by GSM (Global System for Mobile Communications) in the 1980s (See Bertil, n.d. for more information). Following the rapid development of mobile technology that took place after the 1980s, Information and Communications Technology (ICT) has now become a significant factor that plays an important role in our daily lives. Norway, for example, indicates that 78% of enterprises have websites (Statistics Norway, n.d.-a). Norway also offers free Internet access almost everywhere throughout the country, which also supports accessibility and availability of remote working.

Finland is generally known to be one of the leading countries when it comes to Information and Communications Technology. Finland is said to have the highest number of ICT workers in the EU (FiCom, n.d.). The government of Finland perceives high-capacity information network and digital services as being of major importance when it comes to improving the north, making the country more attractive and providing economic benefits. With particular emphasis on *quality of life* and *urban developments* in the Arctic, the government of Finland focuses on various challenges faced in the North such as problems related to mobility, a lack of skilled workers and so forth (See Prime Minister's Office Publications Finland, 2013, for your information). From an environmental perspective, the Arctic region also benefits from use of Information and Communications Technology to navigate and observe weather conditions and maritime safety. This contributes to a strategy for a future in the Arctic that is sustainable in the long term.

When it comes to gender segregation, the Government Offices of Sweden state that all the Nordic countries – Norway, Sweden, Finland, Denmark and Iceland – have a diplomatic agreement on further collaboration on strengthening democracy, gender equality and human rights-based international law and sustainable development. This is based on their agreement on the *Nordic Declaration of Solidarity* (See Government Offices of Sweden, 2011, p. 15).

Despite such a policy, Wennberg, Gunnarsson and Källhammer provide another insight into gender segregation in Northern Sweden and Finland in their research project entitled *Mäta Jämt* (Wennberg, Gunnarsson, & Källhammer, 2013). The *Mäta Jämt* project was aimed to increase awareness of gender equality, diversity and innovation system mechanisms within innovational stakeholders, particularly the ICT sectors. Though this research is not the most recent on this subject, it is still worth looking into the fact that it shows major gender segregation in the labour markets in Sweden and Finland. The ICT sector is one of them; segregated by gender and dominated by men. For instance, the research report *Innovation and gender – how to boost and measure change* produced by the *Mäta Jämt* project states that the research results show that only 20% of workers in the ICT sectors in northern Sweden are female, while this Figure stands at 41% in northern Finland (Wennberg et al., 2013, p. 4).

4 Interviews and method

This section includes three brief summaries of interviews conducted in each country by researchers; Saila Piippola in Sweden, Helena Louhela in Finland and Kanako Uzawa in

Norway. We have devised 11 questions as a general guideline to follow, focusing on the recruitment process, mobility, diversity and gender balance within companies. These questions were used as a semi-structured method so as to provide interviewees with freedom and make the interview more open to follow-up questions. We conducted 12 interviews, and all names of interviewees and their companies have been anonymised. Additional information about the ICT sectors in each country is also provided in this section. We hope to provide some insights for company representatives in order to promote further discussion of diversity and gender in the ICT sectors in Northern Norway, Sweden and Finland.

This report is based on literature review and semi-structured interviews. Four ICT / ICT-dependent companies in Northern Norway, Sweden and Finland were selected on the basis of two philosophies; location, and companies hiring highly educated employees. All interviews were conducted via a digital platform such as Teams and over the telephone due to the COVID-19 situation. The interviews lasted for periods between 20 minutes and an hour.

5 ICT sectors in Norway – *Dr Kanako Uzawa*

Norway is generally recognised as an egalitarian country compared with other industrial countries. This may resonate well in respect of human rights, quality of life and work conditions. However, there are discrepancies between genders in education and management positions. As can be seen below (Figure 3), one statistic for 2017 shows a percentage of women with higher education, significantly higher than men, while the percentage of women in management positions is lower than for men (Figure 4). Another statistic for 2018 shows that 36.3% of women aged 20 to 66 hold leadership positions in Norway, while 63.7% of men in the same age group hold leadership positions (Statistics Norway, 2019).

Figure 3 Source: Statistics Norway

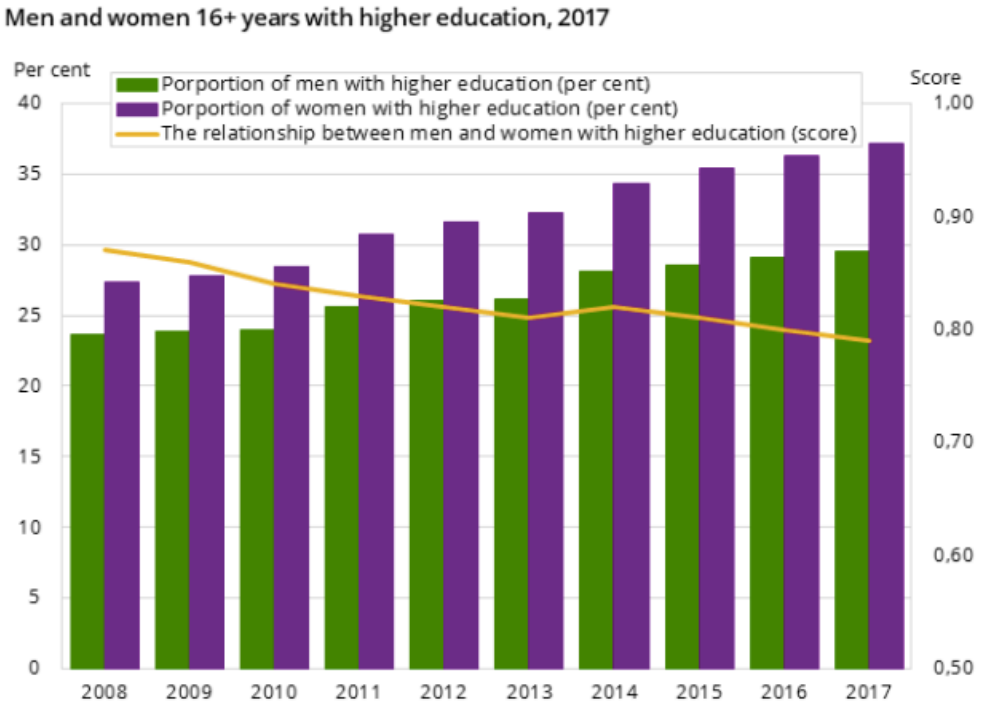


Figure 4 Source: Statistics Norway

When it comes to ICT-related education, the number of female students is significantly lower. The Norwegian Centre for Research Data, NSD, has provided statistics and relevant information about ICT-related education below.

The number of registered (active) students enrolled in ICT programmes at the Arctic University of Norway (referred to below as UiT). The table below includes the following programmes at UiT: 1) Bachelor's degree in Computer Science, 2) Bachelor's degree in Computer Science, Engineer, 3) Bachelor's degree in Computer Security, 4) Master's degree in Computer Science (2 years), and 5) Master's degree in Computer Science (5 years).

Type of programme	Year	Women	Men	Total
Bachelor's degree, 3 years	2015	38	208	246
	2016	41	247	288
	2017	42	288	330
	2018	41	317	358
	2019	52	317	369
	2020*	49	272	321
Master's degree, 2 years	2015	6	41	47
	2016	7	36	43
	2017	6	42	48
	2018	3	34	37
	2019	..	..	42
	2020*	..	..	38
Integrated Master's degree (5 years)	2015	5	90	95
	2016	4	92	96
	2017	9	93	102
	2018	10	105	115
	2019	16	100	116
	2020*	15	93	108

* Figures stated for 2020 are for the spring term. Prior to 2020, figures are stated for the autumn term. (..) denotes fewer than three people persons in the category.

The number of registered (active) students enrolled in ICT programmes at Nord University. The table below includes the following BA programmes at Nord University: 1) Bachelor's degree in Information Systems (INSBA)[2] and 2) Bachelor's degree in Information Technology.

[2] Note that this programme may have changed its content in 2018 to include more economy/management-related topics.

Year	Women	Men	Total
2015	5	47	52
2016	9	67	76
2017	5	39	44
2018	10	32	42
2019	11	18	29
2020*	10	17	27

* Figures stated for 2020 are for the spring term. Prior to 2020, figures are stated for the autumn term.

Source: All information and content in the tables above is provided by the Norwegian Centre for Research Data

All the numbers above clearly show a lack of female students' participation in these subjects, even though student numbers increase every year.

In their article, *Women's experience of role models in IT: Landmark women, substitutes and supporters* (Corneliussen, Seddighi, & Dralega, 2019), Corneliussen, Seddighi and Dralega provide an insight into why it is important to have more female workers in the IT sector in Norway, using a *role model* concept. The article states that there is still gender segregation in the workforce; only 23% of women work in the IT sector, according to Statistics Norway (Corneliussen et al., 2019, p. 2). Their research, which is based on 28 women working in the IT sector in western Norway in 2017–2018, shows a lack of female *role models* in the IT sector. The majority norm of masculinity – and the image that accompanies this – is not appealing to women (See Corneliussen et al., 2019, for your information). Here, having a female *role model* could play an important role; normalising the presence of female employees in the masculine work environment by challenging different perspectives and approaches to tasks.

5.1 The Norwegian case conducted within the Academic North project

I interviewed staff at four medium-sized to large companies located in Northern Norway. Two of them are IT companies (referred to below as companies A and B) offering consultation and software development. The third company is a research-based institution working in the field of marine biology and aquaculture (referred to below as company C). The last one is a largely state-owned company (referred to below as company D) and is active in the energy sector. The companies in question employ anything from 20 to a few thousand

employees. Levels of education differ depending on the company; although a general overview shows that the average level of education is Bachelor's degree, and many staff hold Master's degrees. A number of staff with PhDs at the two IT companies is significantly lower, while just under 50% of employees hold PhDs at the research-based institution.

As regards ***gender*** balance, ICT-dependent companies such as companies C and D have more female employees, including those in leadership positions, while IT companies A and B have only a couple of female employees. Company C expressed a potential reason as to why they have more female employees; more and more female students are receiving an education in natural sciences. Company D has many female employees, but there are fewer female employees in an area requiring physical labour. For IT companies A and B, types of work are not defined by gender; instead, the availability of labour is a key aspect. Both companies say they face major challenges with recruiting female employees. They described several reasons based on their own observations and assumptions: 1) there are generally very few female students within the field of computer science, 2) women with degrees receive attractive offers from larger and state-owned companies offering better salaries and social benefits such as maternity leave, and 3) female employees seem to be prone to move to bigger cities and prefer to work more in creative parts of the field such as game design, which does not really exist up in Northern Norway. "There are more options to choose from in the south, too", says company B. Company B also mentioned a surprising number of female students who applied for their yearly internship. There have been 40 internships in total over the past 20 years, but only one female student applied for a position. Company B also describes how this seems to be a general trend within the company: there are fewer people applying for positions. Company B finds it very challenging to compete with large state-owned companies.

Company A suggests a future task; to make the field of computer science more accessible and interesting for female students. "*A general or traditional social norm could be that younger boys are more interested in games, mathematics and computers, while girls are more interested in politics, health, economics, social science and law*", says company A.

When it comes to the ***recruitment*** process, all the companies focus on different things in terms of gender and diversity. What all the companies share is focus on the skills of applicants; whether they have *real* skills that meet the needs of both the company and its clients. This includes ensuring that employees fit into the social environment in the workplace. For company B, this ability is more important than a knowledge of computer science as it is a small company which maintains close contact with employees both at work

and in private. Company B focuses its efforts on social media and partnership with Arctic University of Norway (hereafter UiT) so that they always have access to internships involving university students.

Company A also uses social media, recruitment agencies, personal networks and contact with UiT. Company A seems to be satisfied with the recruitment process, as they describe how many people are interested in working with them now. This is because they have wider collaborative projects. Another point is that "*Tromsø was not considered to be an attractive place for educated people to work in the past, but this has changed now*". On the other hand, Company C generally finds it difficult to find people with high levels of education and technical skills, although they also use social media, technical magazines and personal contact.

Company D has more tools available for recruitment. Firstly, company D uses internal advertising. If this does not work, it moves to an external channel such as social media. They also implement an annual recruitment process, which offers apprenticeships and graduate recruitments. With this, company D runs a promotional campaign that includes Northern Norway, visiting schools to demonstrate what they do and why the company could be an interesting place for students to work. Company D considers recruiting female students from the North to be important.

There are varying degrees of ***diversity*** among these four companies. Large multinational companies C and D comprise both international staff and female employees, while medium-sized companies A and B have only a few foreign and female employees. Company B, for example, had employees from all over the world but found it difficult to retain employees in the long term as some people, including foreign employees, often *relocate*. Company B invests its effort in welcoming all employees regardless of gender or nationality by creating a workplace where all employees can develop. This involves giving them variety and daily assignments that they can influence if they wish to do so. This extends to providing the family of employees with necessary support in respect of visas, accommodation or language. Remote working is also possible, but the team works on lots of shared projects together with clients and so working together in the office is considered to be positive.

Company A also values the importance of diversity and gender balance, stating that having more female employees would give them a different point of view and more of a dynamic. Remote working has become more common lately, but it can be stated that it is a common practice due to practical reasons. All four companies use both Norwegian and

English in the workplace and offer practical support for new and foreign employees. The large multinational Company D has a clear strategy for raising awareness of *diversity* within the company. Company D describes how greater attention has been focused on diversity over the last five years. Company D considers *diversity* always to be encouraged, emphasising the importance of going outside Norway by ensuring exposure to different cultures. A systematic way of addressing *diversity* started about five years ago. *Diversity* can be measured according to age, background, nationality or prior disciplines in which staff have worked. Company D works on facilitating opportunities for individuals to feel free to be who they are; signalling the importance of diversity by posting a *Pride flag* on an internal social media/website, for example. Finally, company D explains that very few employees generally leave the company; it is important for their employees to have opportunities to develop and learn throughout their professional careers and pursue different careers within the company. Company D maintains an active approach to *diversity* by referring to a quotation used within the company: "***If you are not actively including, you are most probably unconsciously excluding***".

6 ICT sectors in Northernmost Sweden – *Dr Saila Piippola*

Introduction

The ongoing profound impact of digitalisation both in Sweden and globally has turned the ICT and telecoms industry into one of the most important engines for employment and economic growth. In Sweden there will be an estimated shortage of 70,000 people in the ICT sector by 2022, which means that this lack of skills is threatening further growth in Sweden (Von Essen, 2017). According to a Eurostat survey (2016), the digital sector employed 308,100 people – or 6.3% of the total workforce in Sweden – in 2016, which is the second highest level in Europe after Finland (Ibid). Depending on the kind of skills needed in the 21 different areas identified in the ICT sector, the most common relevant educational background is 61% from higher education (Ibid). The lack of skills in the ICT and telecoms sector is both acute and a structural problem, which means that a lot of effort will be necessary in order to fill the labour shortage gap in ICT. For example, authorities need to cooperate with parties such as employment agencies, migration agencies and tax agencies (Ibid). The number of applicants for computer training to Luleå University of Technology, Sweden's most northerly university, also highlights the gender imbalance and shows that the most applicants are male and very few women apply (Universitets- och högskolerådet, 2020).

The main findings from a European labour force survey completed in 2011 show that women are still underrepresented in the ICT sector. Of 1000 women with a bachelor's degree in Europe, only 29 hold degrees in ICT (compared to 95 men), whilst only four go on to work in the ICT sector. According to the report, one problem is that women are more likely than men to leave the sector mid-career. Indeed, 20% of women aged 30 with ICT-related Bachelor's degrees work in the sector, whilst only 9% of women above the age of 45 with these degrees do so. Women are also underrepresented in managerial and decision-making positions (European Union, 2013).

Englund, O (2019) has interviewed 17 women working in the ICT sector and shown that the ICT industry presents many challenges for women when working in the industry. Women encounter challenges when it comes to claiming and aiming their skills; and they encounter cultural challenges in the industry among men who dominate it, which creates a negative culture and male jargon (macho culture) that excludes women. Women's skills are taken seriously, but they are challenged and questioned by male colleagues. Since men dominate the industry, this seems to affect the recruitment process in terms of homosocial reproduction and results in negative organisational cultures that do not attract women. According to Idmark, E (2019), the ICT and tech industry is a branch of society that is currently looking for competent staff; especially women who are underrepresented in the profession. Several ICT companies state that the ICT sector is suffering from a lack of skills that demands more distinct working methods in order to attract and retain employees within the organisation (employer branding), while also making more stringent demands of employers on behalf of employees. This study has shown an example of the kind of future demands ICT students at Karlstad University will make of their future employer. The study has indicated that both male and female students demand factors such as flexibility in terms of time and freedom in the workplace, while also demanding regular feedback from both colleagues and managers. Male students value factors such as salary, a professional role, tasks and company reputation, while women value good management and a culture characterised by a strong team spirit.

6.1 The Swedish case conducted within the Academic North project

This is an interview study among ICT companies in northernmost Sweden, based on four structured factual interviews focusing on gender, diversity and mobility in recruitment processes. Three interviews were conducted over the phone, while one used the Teams

platform. The companies were selected and contacted by email through their own media advertising, and also via a service centre in order to acquire names of ICT companies. The companies that responded to email offered to participate voluntarily in a short interview. After arranging appointments, interviews took place individually and at different times and lasted approximately 30 to 35 minutes. These interviews were not recorded, but written notes were taken. All interviewees hold key positions in these major international ICT companies and have a professional knowledge of the recruitment processes and competition in the sector; particularly in Luleå, with its growing ICT sector. The number of employees varied between 50 and 2500 in the county of Norrbotten, or 30 to 40 locally in Luleå. All interviewees stated that they find recruitment difficult as they are looking at a "wide sector" and find it almost impossible to recruit "the right skills with practical experience" locally.

- *"We work in different industries, everything from aerospace to mining"*

The quotation above also indicates the labour market structure in the Arctic North of Sweden, which is gender-segregated and male-dominated on account of heavy industry. They work as consultants, and their clients are often major Swedish authorities. It requires a contract to recruit people with the right skills, and often the customer's needs determine who is recruited

- *"We are consultants, and we have to bear our clients in mind"*

The quotation above means that the authorities, as their clients, often make stringent demands of their ICT consultants; meaning that they need to speak fluent Swedish and often have a Swedish citizenship, as codes and comments in Swedish authorities' systems are in Swedish. The Swedish authorities also hold data with security classification, meaning that SÄPO, the Swedish Security Service, ultimately decides whether a person can be trusted and therefore employed. One of the interviewees was very clear on the fact that applicants or candidates have to pass tests, such as logic and personality tests emphasising motivation for work.

- *" We just follow our clients' demands and needs, and that controls our recruitment. We adapt"*

These ICT companies often recruit from head office, and their strategy is always to maintain vacancies for spontaneous applications, and one of the interviewees told us that they have a policy of always contacting spontaneous applicants even if there are no vacancies. Vacancies are advertised on social media, via the Swedish Public Employment Service, "Hemlängtan" events arranged by the municipality Luleå in the hope of encouraging skilled staff from the south of Sweden to come back to the north. Another way to recruit is to use LinkedIn, especially when searching for special skills, directly recruiting students from Luleå University of Technology and attending what are known as "labour market days" at the university. Another way to recruit is through personal contact with relatives or people employed abroad.

How to attract employees seemed to be familiar to all four interviewees, which means that they attach great importance to employer branding; maintaining a good, safe image as an employer in order to attract employees when competing with other companies:

- "*Our last HR director even won an award for that kind of work, security is important among our staff"*

To attract and recruit the right skills, the company needs to take entire families into account in some cases:

- *"We organise a variety of events together with employees and their families so that they can socialise"*

When recruiting from another municipality or country. it is important to know the skills of the spouses of prospective employees as well so that they can be helped to find work in the same local municipality:

- *"The whole family is important when recruiting, and if she wants to move back home we usually ask what job her husband does. Often they have similar skills"*

Companies were well aware of the challenges faced in respect of accommodation in the local municipality, but also throughout the region for employees from elsewhere:

- *"We tell them about accommodation options and the current situation, and how they can find accommodation to rent until they know where they want to live, and later on buy something"*

It also became clear that employers want their staff to be able to work in the municipality:

- "*We recruit locally in competition with others to be able to live here in Luleå"*

When attracting skills to the local municipality, regional advantages are one important strategy for competing with companies in southern Sweden:

- "*We need to market the region, stating that if it takes 45 minutes to commute to work in Stockholm, it takes less than 30 minutes from Boden to Luleå. It is all a matter of quality of life up here, we compete on that basis instead of offering higher salaries"*

According to Swedish legal regulations, all employers are expected to work constantly to promote equal rights and opportunities in the workplace. This involves working conditions, recruitment, education, parenthood, salaries and other terms of employment:

- *"We are aware of gender and diversity and our goal is 40%, but this is difficult to achieve. But for us, gender is not what counts – we value skills more highly"*

- *"We are somewhere close to 35% female in all positions. Skills always come first, as we have only a small number of women in the region"*

Another obstacle to recruitment processes is that it depends on who the client is to the ICT company: if the client is a public authority, there are security regulations to consider. Depending on what kind of work is involved, the authorities may require Swedish citizenship and fluent language skills:

- *"We work with diversity, but this is difficult since the security classification"*

As described earlier with regard to difficulty in recruiting locally, interviewees also explained that recruiting from southern Sweden is most common, and if they received applications from two qualified individuals with the same skills, they usually hire both:

- *"If we get two candidates with the right skills, we hire them both regardless of gender"*

Interviewees felt they found it challenging to recruit women, but aimed for equality.

- *"We recruit where the skills are, regardless of gender or diversity. That does not matter, because the skills are the most important thing"*

Another obstacle evident from the interviews was language:

- *"English as a corporate language is more common in smaller ICT companies, but it depends on the client"*

The companies interviewed are major corporations: their corporate language is Swedish, and this is related to different kind of clients and their demands:

- *"We would have had someone from India every six months if our clients allowed that, but the problem is the corporate language of our clients is not English"*

Another important issue with regard to language skills and the corporate language is communication within the organisation, meaning both social and cultural matters:

- *"To be able to speak Swedish in the breakroom and socialise – English soon becomes an unpleasant language to socialise in"*

These interviews have shown the difficulty of recruiting locally as was preferred, meaning that the companies wanted their staff to live nearby and this made it difficult to recruit the right skills. One of the reasons is due to the client's needs and the requirement for fluent Swedish at these companies. Office work on site was preferred, but depending on the client, remote working could also work in some cases. These companies found it difficult to achieve gender equality, even if that was their goal. The main reason is that there are more men than women in the industry. Regardless of gender and diversity, the biggest obstacle to growth is the difficulty in recruiting the right skills. These companies were also well aware of the competition and that they needed to offer good working conditions and take into account families when recruiting from other locations. From the interviews, it has also emerged that language is important but not the main reason for recruitment: instead, the client's needs are what impact on recruitment.

7 ICT sectors of Northern Finland – *Dr Helena Louhela*

Between 2009 and 2014, some 3500 people were laid off in the Oulu region by Nokia and its subcontractors at ICT companies. However, the situation has rapidly changed for the better. The Oulu Chamber of Commerce (Kauppakamari) released a report written by Jurvakainen in June 2018 which mapped out the needs of ICT companies in respect of professionals and special skills (for the period 2018 to 2022) in Oulu. This survey was conducted over six months.

The results of this survey demonstrated the great need for experts, created by the region's strong ICT position and the international companies that had established operations in the Oulu region. In addition, more than 500 high-tech startup companies have been set up in Oulu over the last five years (Jurvakainen, 2018).

According to Jurvakainen (2018), around 1100 people were recruited in the Oulu region for the ICT sector in 2017. This year, the estimate is the same. Based on views collected from the companies, approximately 1800 recruitments are expected in the Oulu region in 2019 and 2020. The need for 1800 experts is approximately 12% of the current ICT staff in Oulu (Jurvakainen, 2018).

Based on the survey (Jurvakainen, 2018), about 40% of companies want employees with more than two years of work experience, while about 30% of companies want to recruit new graduates. In addition, in the next few years, the need for ICT experts will be up to double or triple in relation to the graduating students. About 60% of the recruitment need (1800) are software professionals and 20% of HW-RF-mechanics specialists. The need for sales and marketing experts is about 6%. The need for recruiting project managers or equivalent professions is about 4% (Jurvakainen, 2018).

The importance of having foreign students as well as already educated foreign experts to work at the ICT companies in Oulu has been highlighted according to Jurvakainen (2018). In this respect, Business Oulu had a project entitled Talent Attraction, the aim of which was to bring ICT experts from Brazil to work in Oulu. Another answer to the recruitment challenges was the "Osaavat Ohjelmoijat" (Competent Programmers) project, funded by the European Social Fund between 2 April 2018 and 27 March 2020. The aim of the project was to identify the needs of ICT companies in Oulu and, based on that, to plan and implement training experts using flexible adult learning methods. The training packages benefit the

existing university training provision, and the project will train skilled workers for companies with ICT skill shortages (Jurvakainen, 2018).

Jurvakainen (2018) emphasises that if the biggest need previously was to have work according to education, now the need is to organise more training according to the existing work. The University of Oulu is currently receiving 200 ICT students each year, and a one-off specialisation programme (muuntokoulutus) is currently running with the same number of students. The Principal of the University of Oulu[3] has publicly stated that the university is ready to invest in an increase in degree programmes, which will require close cooperation with high schools and recruit maths and science students who are capable of completing the qualifications. The Principal also added that training should be used specifically to attract international workers, as we will not be able to survive alone in Finland.

The Oulu Polytechnics of Information Technology are currently accepting 210 students a year, of which 40 follow English-language courses. There have been about 150 ICT graduates over the past few years (130 software professionals and 5-10 HW-RF mechanics specialists). However, specific training places have been arranged for the specialisation programme (muuntokoulutus), and women have been recognised as largely untapped potential for the ICT sector[4].

Women and the ICT sector

According to a survey (Bairoh, 2016) by the Technological Academics, a Finnish Trade Union Organisation [Tekniikan Akateemiset], women participating in technology has gradually increased in Finland. However, the labour market situation of women is considerably weaker than for men. Women have less full-time work, and unemployment among women has remained higher than for men throughout the 21st century. Women are less likely to be in managerial positions and more often in fixed-term positions compared to men. In particular, young women have fewer permanent work contracts. The jobs of women and men who have completed the same qualifications (DI) differ. Men work more in industrial places, women are more often employed at universities or in local government

[3] News in Kaleva, 18.6.2018. Retrieved from: https://www.kaleva.fi/ict-ala-vetaa-oulussa-edessa-on-positiivinen-tyovo/1802456
[4] News on the City of Oulu website. Retrieved from: https://oulu.com/fi/ouluun-kaivataan-lisaa-ict-alan-osaajia/

positions. Women working as experts or middle management women's euro is about 95 cents, but in the top management it is only 84 cents[5].

Based on this survey (Bairoh, 2016), it has been found that 30% of women have experienced gender-based discrimination, and 9% family or pregnancy-based discrimination. Nearly one in three of 25 to 54-year-old women and one in four women aged 55 to 64 have experienced discrimination or unequal treatment in their work organisation over the last year. Discrimination or unequal treatment experienced by women in the work organisation clearly varies by sector. It is most common in industry, municipalities and engineering. Discrimination against women or inequality within organisations varies somewhat according to the position and is experienced most often by middle management women.

Women are working, in particular, in the ICT fields of expertise or architecture that are defined as so-called equality professions. Otherwise, quite a lot of professional groups in technology are male dominant.

Statistics compiled from Tilastokeskus [Statistics Finland] in 2019 also confirm this:

		MEN						WOMEN					
		2016	2015	2014	2013	2012	2011	2016	2015	2014	2013	2012	2011
INFORMATION AND COMMUNICA-TION TECHNOLO-GIES SPECIALISTS	NORTH OSTRO-BOTHNIA	3 866	3 544	3 305	3 155	3 261	3 290	854	821	820	812	876	926
	LAPLAND	688	700	672	626	681	771	195	191	189	184	187	200

7.1 The Finnish case conducted within the Academic North project

Representatives of four ICT companies operating in the northern areas of Finland participated in the structured interview (see Appendix 1: Questions) about cross-border mobility and recruiting practices with emphasis on gender and diversity. Three of the interviewees were human resources (HR) experts, and one was a recruiting supervisor. Interviews were conducted by the author of this text. One of the interviews was conducted over the phone and three using the Teams meeting platform, and each interview lasted 30-45 minutes. The sizes of these companies varied from 30 to several thousand staff members at a national level. The

[5] women earn much less than men

education levels of staff were equally divided between either University of Applied Sciences or higher university education.

Typically, the HR experts and the local company managers run the recruitment process together: however, the number of responsibilities for each party varied at the different companies. In one company, where the role of the HR experts was smaller, it was hoped this role would be bigger. Direct headhunting and using external recruitment agencies are not so common, but these methods are applied in some cases. Vacancies are mostly advertised on the companies' own websites, national vacancies websites and LinkedIn. The job search culture seems to be changing: for example, the company has to be more in touch with passive jobseekers through LinkedIn, for example.

Mobility across and within borders – connected with company values

Besides the actual job description and advertising the companies' own products and clients, three of the companies highlighted communality as their fundamental value. This means that even if the work applicant is something of a guru in their own field, if teamwork is beyond them then it is unlikely, they will be hired. Communality is being kept alive by preferring office work over remote working. Creating a genuinely caring and welcoming atmosphere for the office was said to be the main emphasis at one of the companies. Moreover, everyone's opinions are also respected and listened to at all levels of the organisation. One company highlighted the northern aspect when it came to the ways in which decisions are made in Oulu on a local level.

At all the companies, office work was preferred even though remote working has also been possible. However, the COVID-19 situation has meant there may be changes in working practices. Some workers have now discovered that remote working is suitable for them: there are not so many interruptions, there is no commuting and workspaces are quieter than in an open plan office, for example. Some workers have been lonely, especially the ones living alone. All interviewees anticipated that new practices will be developed in future. There are different kinds of commuting among employees. Some live permanently in southern Finland and spend their weeks in Oulu. Some commute daily from further away (100 km). Remote factory work is not possible, of course, and at one company some tasks cannot be conducted outside the office.

It was stated that there are generally not so many applicants for work in Finland from the Nordic countries. It was guessed that this was a cultural factor, as it was assumed that Finnish people do not relocate easily to find work. It may also be a wage issue, especially in

the case of Norway. There are lots of applicants from India and China, for example. More applicants from Russia would be preferred, because their maths skills are of such high quality.

Support in mobility to the future employees

Two of the companies can be profiled as international companies, and two others have local values. At these international companies, it is common to use external assistance for relocation (work permits, tax support, housing, relocating), and they also offer financial help to employees (for relocating). It was mentioned how recruitment from outside the EU can be challenging, as it usually takes four months to obtain a work permit.

At local companies, HR experts and local managers can help with practical matters if needed, but it is not typical and the questions about potential practical assistance were considered surprising. One company collaborates with cities and organises joint information events for families where they provide information about issues such as daycare centres, job searches (spouses) and how to find apartments. This particular company is well aware that if the family fails to integrate, the employee will leave. Therefore, in some situations a spouse has also been hired if they work in the same field.

The two companies that most value working at the office as a communal matter prefer to start recruitment locally. At one company, vacancies are initially launched in-house by offering current staff the opportunity to change places and move to different locations. However, all job ads can also be viewed globally via various channels.

Recruitment process in regard to gender and diversity

In Finland, there is a legal obligation to compile an equality and diversity plan which applies to employers who regularly employ at least 30 people. The smallest company participating in this survey has always employed fewer than 30 people and so did not have the existing diversity plan in place. The other three companies do have the plan in place, but the exact policies on how to further equality in practice were not so clear.

However, the companies that were internationally orientated were very gender-responsible. Both have been part of different projects linked to promoting equality in the ICT sector. At one company, the company's management team seeks to maintain an even distribution from the gender perspectives of its members. About 40% of the management team are women at present, but this figure was previously 50%. Companies are clearly aware that there are more men as workers in this sector, and the root cause of this is that there is a

shortage of women applying for ICT education. One of the companies is cooperating with universities on this matter. It is indicated that gender distribution is the other way around at human resources departments as there are more women than men, and it is also a matter of education.

One of the companies is making a great effort to interview female jobseekers in order to promote women's employment in this sector, and gender diversity is important to the company. However, this same company still stated that if there are two equal jobseekers, a man and a woman, they will not lean towards either sex. None of the companies mentioned having any definite official policies on what to do in this specific situation involving two equal jobseekers, a man and a woman. However, two of the companies have a practical (and personal) tendency to hire a woman in order to promote women's employment in this sector. At the fourth company, it was strongly stated that gender is not a factor in the recruitment process, and it was predestined as a non-discriminating policy.

At one of the companies, the work often requires security clearance, which in turn requires Finnish citizenship. At all the companies, the official language is English. In practice, the language does of course depend on the situation. In internationally orientated companies, proficiency in Finnish is not stated as a requirement in the job advertisement but proficiency in English is essential. It is also stated that companies place too much emphasis on proficiency in Finnish, and this limits the recruitment of competence quite a lot.

To sum up from the case in Finland

- More guidance on how to put equality and diversity plan guidelines into practice is needed in order to further the employment of women in ICT sectors.
- More education on what diversity and gender responsibility mean in the workplace, would be beneficial for human resources and recruiting staff at ICT companies.
- The more internationally orientated the company is, the more efficient practical support they have for receiving international employees.
- Company values affect employees' chances of working remotely and being mobile, but also on the company's chances of hiring international talent.

8 Conclusion

Given the ongoing critical phase that we are all facing around the world, be it a global warming, climate change or even COVID-19, all three countries recognise the importance of long-term sustainability. This involves different stakeholders in society, requiring each stakeholder to interact with the others.

Norway, Sweden and Finland pay special attention to the northern parts of these countries by setting up specific policies in order to attain their goals and potentially benefit the local economy, culture and community. Sweden, for example, sheds light on environmental technology within business and innovational industries for their sustainable futures (See Government Offices of Sweden, 2011, p. 31 for more information).

One focus of this report is employment within ICT sectors in the Arctic North from perspectives of mobility, gender and diversity. This research clearly signals a lack of female employees in ICT sectors and a general image of ICT sectors as a male-dominated work environment. The above case study from Sweden's Karlstad University shows clear differences in the kinds of work conditions that attract people; male students are more drawn to salary, role, task and company reputation, while female students seek good management, work culture and a good atmosphere.

Despite the low numbers of female employees in ICT sectors, one main finding in this research shows that most interviewees clearly indicate a great deal of interest in recruiting female employees. Companies A and B in Norway, which have very few female employees, showed a strong interest in recruiting female or foreign employees in order to enhance diversity and a willingness to create a culturally rich work environment. In addition, all companies emphasised a non-discriminatory policy and stated that a recruitment process is based more on *skills* rather than gender. However, one company in Norway described how the nature of the work will sometimes define which gender is more suitable for the job, especially when it comes to physical labour.

Different limitations can be also seen in work situations where a company has to decide who is the most suitable for a certain job. For example, this research shows that there are certain limitations in who is qualified for jobs when strict security clearance is required, even in regard to nationality. Some jobs require native language skills, which excludes foreign employees who are not yet fluent in the language. Foreign employees who are not yet fluent in the language or culture may feel excluded in the breakroom when a common language changes into the native language of the country, despite the official language of the

company. One company that consciously works with such challenges is company D interviewed in this project. This major multinational company applies an active strategy for working towards *inclusion* and *diversity*. There is in fact a company quotation that is used internally: "***If you are not actively including, you are most probably unconsciously excluding***".

Returning to the recruitment process, the critical question to be asked here is who do *skills* define in a recruitment process, and how? This important question is raised and discussed by a business model known as *RICHER business models* (See Gender Smart Arena, 2020, for your information). *RICHER business models* offer innovative thinking for companies and organisations that goes beyond stereotype filters in ICT sectors. This provides an opportunity for employers to reflect and challenge existing recruitment policies by enhancing the importance of diversity and gender components.

Another point worth noting is the change that occurs over time in the recruitment process. Jurvakainen (Jurvakainen, 2018) indicates a change in the recruiting process from the past; that is, to organise more training according to the existing work rather than to have work according to education. As a recruitment strategy, multinational company D in Norway focuses its efforts on arranging a trip to Northern Norway as part of a recruitment process. They visit schools in order to talk to younger and potential future employees about their possible careers and potential. Having links with universities is also seen as important as a way of securing potential employees for the future. Recent recruitment processes seem to depend on how companies are presented. Such images can be projected through LinkedIn, Facebook and any other social media platforms.

When it comes to enrolment of female students in computer science, statistics above confirm the low numbers of female students enrolling for these subjects. Moreover, these research findings indicate that female students have a tendency to choose more creative jobs such as a game design, or else secure jobs in local government or at universities rather than private IT enterprises. This is supported by one of companies, which states that skilled female employees often receive good offers from several companies. There is a great deal of competition among highly skilled female employees in ICT sectors. This also means there is a frequent workforce mobility due to better job offers and opportunities. Furthermore, one of the findings shows a general trend for more talented people to move around within a country, and it is difficult to employ them long-term as they often receive better offers in terms of salary and benefits. From the company side of things, they make an effort to offer certain

support for foreign or other employees who relocate in order to take on a new job. Remote working is more commonly practised, especially in the wake of COVID-19.

Visibility of female employees in ICT sectors could create a safe, attractive and comfortable work environment for women. Recognition of professional and cultural background can play an important part in strengthening teamwork and motivation. This can be taken positively in that it provides an opportunity for both employers and employees to reflect and challenge their understanding of *diversity* and *gender* in the work environment.

How to balance diversity and gender presents a challenge. What can measure such balance within a company, and how? The *Mäta Jämt* project offers practical tools for tackling such challenges. The *Mäta Jämt* project attempts not only to enhance awareness of diversity, gender and regional innovational systems, but also to increase awareness of *sustainable* gender and diversity within companies, particularly in the ICT sectors (See Wennberg et al., 2013 for your information). This is achieved by means of tools and methods developed in collaboration with Ritaharju Community Centre (RCC) in Oulu and the SATIN project at the Centre for Distance-spanning Technology, Luleå University of Technology, as integration projects. These tools and methods provide specific ways for both employers and employees to assess the work environment. For example, this includes a mobile application known as *Gender App*, which provides a practical checklist for organisations or projects so that they can maintain an overview of integration practice and gender considerations (SATIN PROJECT, n.d.). Another innovative and useful method is *GENOVATE*. *GENOVATE* is an action research project with emphasis on gender equality concerns in research and operates with and across seven European partner institutions (GENOVATE, n.d.). With this, it enriches gender and diversity management capacity within cross-disciplinary research institutions (See GENOVATE, 2013, for your information). Such tools and methods are readily accessible online and can be used to strengthen the work environment for our sustainable futures.

Finally, based on all findings in this research, this report recommends two fronts; long-term and short-term strategies. Firstly, a long-term strategy is to start promoting the ICT sectors as an attractive place to work that offers unique opportunities to women. Young people such as high school students and first-year Bachelor's degree students should form the target group. This will allow the shortage of women in the ICT sectors to be expressed positively rather than negatively. Uniqueness can be introduced by means of an equal wage, work benefits and conditions for employees in the work environment. Secondly, a short-term strategy would be to aim for employers to work actively on their internal work cultures. As a

large multinational company in Norway stated earlier as an important philosophy within the company, "***If you are not actively including, you are most probably unconsciously excluding***". This is a good reminder and an important point to take into serious consideration in company policy, welcoming all employees and making them feel safe in the work environment regardless of gender and cultural background.

Recommendations from this research report – sustainable future toolkit

To promote diversity and gender inclusion, this report recommends that the ICT sector:

- Reassess its work environments and conditions – salary levels, short-term contract, teamwork, active participation and leadership.
- Review recruitment process and its concept of *competence*
- Actively involve and include employees and their family members in social activities.
- Review quality of life factors such as housing, commuting and leisure.
- Collaborate with local members of society to support employees' everyday lives.
- Make the field of computer science more attractive and interesting for female students (ex. through role models).
- Collaborate with universities / higher education institutions to recruit good potential employees.
- Re-evaluate what diversity and gender inclusion mean and how they can be implemented in the workplace.

Appendix 1 Interview guide

Recruitment and mobility in the ICT sector – survey

June 2020

QUESTIONS

1. How many employees does your company have? What is their average level of education?

2. How does your company recruit employees: use of recruitment agencies, social media, other advertisements and contacts? What challenges do you face in the process, if any?

3. What would you characterise as an attractive workplace in your company when recruiting talented people?

4. Are there any specific considerations in the recruitment process with regard to gender and diversity?

5. Does your company have any preferences or better accessibility in the recruitment process in respect of regions, countries, etc.?

6. Does your company take into account spouses and family situations when recruiting staff?

7. Does your company provide any practical assistance for employees relocating from elsewhere?

8. Is it considered common practice within your company to commute or work remotely?

9. Are there any divisions of work by gender in your company? If so, why?

10. Which language is used mostly at your company? Do you face any challenges with regard to language?

11. Is there anything else you would like to share in relation to the recruitment process at your company?

References

Bairoh, S. (2016). Naiset ja miehet tekniikan alalla [Women and men in technical sector]. Retrieved from https://www.tek.fi/fi/uutishuone/tutkimukset/naiset-ja-miehet-tekniikan-alalla

Bertil, T. (n.d.). Cooperation Across the Borders. Retrieved from https://www.teliacompany.com/en/about-the-company/history/nmt--a-nordic-project/

Corneliussen, H. G., Seddighi, G., & Dralega, C. A. (2019). Women's Experience of Role Models in IT: Landmark women, substitutes and supporters. doi:10.18261/9788215034393-2019-18

Englund, O. (2019). *IT-branschens utmaning och förändringar med att rekrytera in kvinnor – en kvalitativ studie om hur kvinnor upplever de att arbete inom IT-branschen.* (Master). Luleå Tekniska Universitet, Luleå, Sweden. (Diva.org:ltu-77084)

European Union. (2013). *Women active in the ICT sector in EU publication final report: Directorate-General for the Information Society and Media*: European Unionen.

FiCom. (n.d.). Digital Finalnd in Europe. Retrieved from https://www.ficom.fi/english/ict-finland

Gender Smart Arena. (2020). What are RICHER business models? Retrieved from https://richerbusiness.eu/richer-business-models/

GENOVATE. (2013). *Transforming Organisational Culture for Gender Equality in Research and Innovation*. Retrieved from University of Bradford University of Bradford

GENOVATE. (n.d.). About Genovate. Retrieved from http://www.genovate.eu

Government Offices of Sweden. (2011). *Sweden's strategy for the Arctic region,* . Retrieved from https://www.government.se/49b746/contentassets/85de9103bbbe4373b55eddd7f71608da/swedens-strategy-for-the-arctic-region

Guttorm, G. (2019). Traditions and traditional knowledge in the Sámi culture. In G. Neyooxet (Ed.), *Being Indigenous: Perspectives on Activism, Culture, Language and Identity* (pp. 65-75). New York: Routledge.

Idmark, E. (2019). *Framtidens medarbetare inom IT – en jämförande studie: En kvalitiv studie om kvinnors underrepresentation inom IT-branschen uifrån IT-företaget Ateas´samt kvinnliga och manliga IT-studenters perspektiv.* (Bachelor). Karlstads Universitet, Sweden (Diva-org:kau-72362)

International Labour Organization. (n.d.). C169–Indigenous and Tribal Peoples Convention, 1989 (No.169). Retrieved from https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169

Jurvakainen, R. (2018). *ICT Osaamisselvitys [ICT Competence Investigation]*. Retrieved from Oulun Kauppakamari [Oulu Chamber of Commerce]:

LKAB. (n.d.). About LKAB. Retrieved from https://www.lkab.com/en/careers/work-at-lkab2/

Norwegian Ministry. (2017). *Norway's Arctic Strategy- between geopolitics and social development*. Retrieved from https://www.regjeringen.no/contentassets/fad46f0404e14b2a9b551ca7359c1000/arctic-strategy.pdf

Norwegian Ministry of Foreign Affairs. (2009). *New Building Blocks in the North The next Step in the Government's High North Strategy*. Retrieved from

https://www.regjeringen.no/globalassets/upload/ud/vedlegg/nordomradene/new_building_blocks_in_the_north.pdf
Norwegina Ministry of Foregin Affairs. (2006). *The Norwegian Government's Hight North Strategy*. Retrieved from https://www.regjeringen.no/globalassets/upload/ud/vedlegg/strategien.pdf
Prime Minister's Office Publications Finland. (2013). Finland's Strategy for the Arctic Region 2013. Retrieved from https://vnk.fi/documents/10616/334509/Arktinen+strategia+2013+en.pdf/6b6fb723-40ec-4c17-b286-5b5910fbecf4/Arktinen+strategia+2013+en.pdf
SATIN PROJECT. (n.d.). Gender & Diversity. Retrieved from http://www.gdtoolbox.eu/toolbox/tools-and-methods/gender-app/
Statistics Norway. (2016). Population and land area in urban settlements, 1 January 2016. Retrieved from https://www.ssb.no/en/befolkning/statistikker/beftett/aar/2016-12-06.
Statistics Norway. (2019). Indicators for gender equality in municipalities. Retrieved from https://www.ssb.no/en/befolkning/statistikker/likekom.
Statistics Norway. (n.d.-a). ICT usage in enterprises. Retrieved from https://www.ssb.no/en/iktbrukn.
Statistics Norway. (n.d.-b). Key figures for the population. Retrieved from https://www.ssb.no/en/befolkning/nokkeltall/population.
Statistics Sweden. (2018). Most innovation cooperation in northern Sweden. Retrieved from https://www.scb.se/en/finding-statistics/statistics-by-subject-area/education-and-research/research/community-innovation-survey/pong/statistical-news/innovation-activity-in-enterprises-in-sweden-2014-20163/.
Universitets- och högskolerådet. (2020). antagningsstatistik. Retrieved from https://www.uhr.se/studier-och-antagning/Antagningsstatistik/soka-antagningsstatistik/
Von Essen, F. (2017). IT-kompetensbristen - En rapport om den svenska digitala sektorns behov av spetskompetens. Retrieved from https://www.itot.se/app/uploads/sites/2/imported/ITTelekom-Rapport-Brist-Pa-IT-kompetens-webb.pdf
Wennberg, P., Gunnarsson, E., & Källhammer, E. (2013). *Innovation and gender - how to boost and measure change*. Retrieved from https://issuu.com/cdt-ltu/docs/cdt_matajamt_webb
World Population Review. (n.d.). Finland Population 2020 (Live). Retrieved from https://worldpopulationreview.com/countries/finland-population
Worldometer. (n.d.). Sweden Demographics. Retrieved from https://www.worldometers.info/demographics/sweden-demographics/.