# Educated People with Disabilities in the ICT Field

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Educated People with Disabilities in the ICT Field

Completed Research Paper

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Abstract
The purpose of this study was to find out if highly educated individuals with physical disabilities are employed in the ICT sector. This question is important due to little knowledge thus far despite the fact that there is a large group of disabled people who have graduated in the ICT sector, however unemployed.

An empirical study was carried out with the help of a qualitative research method based on nine semi-structured interviews. The study showed that disability has a significant impact when people choose the ICT sector for their studies. In addition, the study showed that people with disabilities can be employed in the ICT sector.

The study also showed that people with physical disabilities are mainly able to work in the ICT sector independently and that they integrate into the working community well. It was also significant that almost all interviewees had a long career with the same employer.

Keywords
Disabled people, ICT sector, high education, employment, social inclusion.

Introduction

The purpose of this study was to investigate if highly educated people with physical disabilities get jobs in the information and communication (ICT) sector after they have graduated with a diploma suited for the ICT sector. The study also investigated if the disability had affected their choices regarding their field of study and how they felt their disabilities had affected the work environment.

In the past, people with physical disabilities (PWD) were self-employed, for example, as cobblers, goldsmiths, TV technicians, or in other occupations that required manual skills. Today, many of these professions have been lost as a result of the development of society (IT Bulletin, 2013.)

The ICT sector has a very significant impact on the Finnish economy, although this effect has diminished during the last 10 years. Jalava and Pohjola (2007) report how the contribution from the use of ICT to output growth in the market sector increased in the 1990s in Finland; however, they suppose that there is still a lot to do. Despite the significant role ICT played in the climb out of the deep recession, there has been no acceleration in the trend rate of labor productivity. The sector has faced a lot of changes in recent times and staff cutbacks have been made. Likewise, Abdelgawad et al. (2012) report how the number of unemployed PWD in Norway has not decreased despite the supportive actions carried out by the public services sector.

Work in the ICT sector does not require many physical characteristics, and thus the work is not physically demanding. Therefore, there is a lot of work in the ICT sector that suits people with disabilities well. Banks and Lawrence (2006) also reported in their study that PWD are able to work non-manual jobs better and longer than manual jobs.
Adding to that, Vidacek-Hains et al. (2011) report about the increasing number of PWD who are eager to receive a higher education. They note that several institutional resources make it possible to offer higher education to people with learning difficulties or other disabilities. In Finland the government is committed to increasing educational equality and access to education. Disabled persons are encouraged to further their autonomy and social participation with further education. The efforts to support education are independent of age or disabilities (STM, 2012, p. 41–42).

The following question guided the research topic: Do highly educated PWD find jobs in the ICT sector? The topic was investigated with the help of questioning how disabilities affected choosing the ICT sector, how they impacted employment, and how they impacted the ICT sector.

The study was conducted with a qualitative research method using semi-structured interviews. The empirical part of the study included interviews with nine Finnish men with disabilities. All interviewees had completed a university or a polytechnic degree suitable for the ICT sector or were near graduation. The interviewees had also worked or they presently worked in the ICT sector during the study. Interviewees' disabilities varied widely.

The analysis of the results shows that disabilities have a significant impact on the choice of studying in the ICT field, but that IT was also a hobby which had contributed to the decision.

Researchers have previously pointed out in the literature that people with disabilities face a difficult employment situation in Finland (STM, 2012, p. 45). Furthermore, studies have demonstrated that nearly all PWD had difficulties in finding employment, regardless of their degree (Vidacek-Hains et al., 2011). However, almost all of the people who were involved in this study were employed after completing their studies. A few interviewees, however, had experienced inappropriate conduct during an employment interview. The literature also suggested that the IT sector could be a sector where PWD can find employment in the future (IT Bulletin, 2013, p. 26). This finding seems to be true in light of this study as well.

Despite the small number of interviewees, this study verified that PWD can be employed in the ICT sector in spite of their disabilities, and that they are able to integrate into the work environment.

**Prior research**

During the last decade we have seen how ICT is transforming the world, enabling productivity and creating new ways to live and work across the globe. In their annual report about global information technology, Bilbao-Osorio et al. (2013) describe how the world has experienced massive changes, including, for example, the disappearance of the Internet bubble and the fact that emerging countries like China and India are notable users and providers of ICT. However, Jalava and Pohjola (2007) argue that despite the fast growth of multi-factor productivity in the ICT-producing industries, there has been no acceleration in the trend rate of labor productivity.

Likewise, Böckerman et al. (2012) explain that if ICT is to change the processes of an organization, the number of jobs will decrease since certain jobs will be replaced by ICT. They note that if ICT is creating new jobs the organization will hire either inside or outside the organization. They also reported that ICT and associated organizational restructuring mainly affects those employees who stay with the same employer and that that the organizational restructuring has a somewhat larger effect on the wage growth of the occupation switchers.

Meager and Hill (2005), who studied labor market participation and employment of PWD, reported that the concept of disability is very broad. They note the difficulty of defining disability, the definition of which seems to vary in surveys and official data sources. For example, the World Health Organization (WHO) defines the concept of disability related to physical limitations or participation constraints. Disability in this context can refer to the body, including, for example, functional or structural impairment. Participation constraints in this context include those factors that cause difficulties for the individual to perform tasks or to act in their environment (WHO, s.d.).

In the late 1990s, Kitchin et al. explored PWD’s employment experiences in Ireland. They interviewed twelve disabled persons and four assisting persons with an in-depth informal conversational strategy. Their study revealed a number of problems, such as disability awareness, the importance of removing barriers, and the need for stronger legislation (Kitchin et al., 1998).
Furthermore, Andreassen (2012) pointed out that PWD can meet doubts about their ability to work and adapt to the work environment in the workplace. McFarlin et al. (1991) noted twenty years earlier that employers can hold prejudiced views regarding what PWD can offer in the workplace and how they integrate into the workforce. Murray (1994) also revealed that PWD receive lower salary than non-disabled employees.

In Finland there are about 1,000 PWD who have a university or polytechnic degree but are outside the labor market. In particular, young PWD are well educated (IT Bulletin, 2013, p. 26). According to Statistics Finland (s.d.), in 2011 a total of 28,482 university degrees and 22,898 polytechnic degrees were completed in Finland. During the study, 4.5% of highly educated people were unemployed (Akava, s.d.).

Crowther et al. (2001) sought the most effective way of helping people with severe mental illness to get a job. In the U.K. people disabled by severe mental illness have particularly high unemployment rates. Based on their study, Crowther et al. report that supported employment produced better results in helping such people find employment than prevocational training. They also argue that people with mental illness should receive special attention from public services due to laws in the U.K. As an example related to supported employment, Crowther et al. (2001) mention the usage of trained “job coaches” or employment specialists to support people to find employment.

Vidacek-Hains et al. (2011) propose a supportive and effective academic environment for students who have disabilities. The environment would offer contemporary information and communications technology for the students. Based on their experiences, Vidacek-Hains et al. (2011) believe that such learning environments would be valuable in the future.

The Rehabilitation Research and Training Center on Disability Demographics and Statistics’ (StatsRRTC) studies show that in the year 2007, only 15.5% of people with disabilities in the U.S. were enrolled in a university or a polytechnic school, compared to non-disabled people who were enrolled at a rate of 25.1%. The study looked at people between 18 and 34 years of age (StatsRRTC, 2009, cited by Vidacek-Hains et al., 2011). In general, men register in engineering or computer science programs more often than women do (Siann and Callahan, 2001).

In many countries the law guarantees the rights of persons with disabilities. For example, in the U.K., the Disability Discrimination Act (DDA) makes discrimination on grounds of disability unlawful (Banks & Lawrence, 2006). In the Finnish Employment Contracts Act (Finlex, 2001), disability is mentioned as follows:

The employer shall not exercise any unjustified discrimination against employees on the basis of age, health, disability, national or ethnic origin, nationality, sexual orientation, language, religion, opinion, belief, family ties, trade union activity, political activity or any other comparable circumstance.

In Finland, the unemployment rate of PWD is significantly higher than that of the non-disabled. It is very difficult for a person with a disability to find their first job in Finland. The administrative sector under the Ministry of Employment and the Economy help people with disabilities find employment (STM, 2012, pp. 45–49).

Obstacles to employment of persons with disabilities can be removed in the future, if necessary, by adopting progressive labor market policies. Labor policy actions may include career counseling, supported employment, and closer cooperation between workplaces and educational administration. A particularly important operation is to provide young people with disability support so that they are able to work immediately after they graduate (STM, 2012, pp. 45–49).

From a broad point of view, ICT is a valuable tool for PWD. Many studies show that PWD can take advantage of ICT. They can utilize ICT in their social life, in their studies, and for their personal needs. According to many studies, a number of Europeans with disabilities are able to access information technology. Studies show that in all countries, ICT is not utilized as much as it could be for PWD. Studies also show that PWD’s attitudes and concepts toward ICT vary from country to country (Stendal, 2012).

**Empirical Research**

This section is divided into the following three sections: Research Data, Analysis, and Main Results.
Research Data

The empirical material was obtained from semi-structured interviews with nine people. The questions were based on the literature review and were submitted to the interviewees before the actual interview to enable pre-thinking. In this study, all of the interview questions were open-ended questions in order to provide a real opportunity for the interviewees to express what they had on their minds.

The researchers asked the interviewees twenty-one questions related to the interviewees’ disabilities, studies, and work. The researchers promised the interviewees that their identities would remain hidden. The interviews were held mainly at the workplaces of the interviewees. Each interview took about 30 minutes and were conducted in Finnish. All the interviews were audio-recorded and transcribed by the first author. The quotations were translated by the authors. Two interviews were conducted via Skype, while the remaining interviews were conducted face-to-face.

A brief description of each of the nine people interviewed is provided next. The descriptions were based on the answers given by the interviewees, and they were approved (by the interviewees) before publishing.

Hans (Cerebral palsy, 34 years old)
Hans had pursued ICT studies at the final stage at university; the master’s thesis was still in process. The disability had partly influenced the choice of the place of education, but other options had been considered as well. The interviewee had been interested in computer technology since his youth and thus the ICT sector had been a natural choice.

Stephan (Congenital partial hemiplegia, 27 years old)
Stephan has graduated from university in 2013. Before completing these ICT studies, he had graduated from polytechnic school. His disability had affected the choice of occupation by 40 to 50%. He had had options in other areas, but the ICT sector's studies had seemed interesting and desirable in light of his disability. He had begun with information technology as a hobby in the third grade.

Tom (Visual impairment, 51 years old)
Tom had studied at university in the 1980s in other sectors. He was in the final stage of his studies in the 1980s when his eyesight had deteriorated so much that the studies had to be interrupted. In 1994, Tom begun to study the ICT industry at polytechnic school and he graduated in 1999. The injury affected the choice of study in the polytechnic school. Tom had been interested in information technology since the late 1980s.

Simon (Paraplegia, 46 years old)
Simon had studied at polytechnic school in the past and then started ICT studies at the Faculty of Technology. In the middle of his studies he changed his major and graduated in 2001. The injury had not influenced his choice regarding the place of education. Internship and co-workers' encouragement had affected more than the injury. Before his ICT studies, Simon was not interested in information technology.

Adam (Progressive nervous system-derived muscle weakness disease, 26 years old)
Adam graduated from polytechnic school in 2010. He had not chosen his place of study on the basis of his disability, but admits that the disability might have contributed to this decision. Adam had also had other options in the selection of the study field. He has been involved in ICT since he was seven or eight years old.

Ken (Congenital amputation of the right leg upper thigh, 31 years old)
Ken graduated from a polytechnic school in 2004. The injury had affected the choice of a place to study in such a way that he could not think of training for manual labor or even for a job where he would need to stand for long time periods because of his disability. Ken had been involved in information technology since the age of six.

Thomas (Short stature, 35 years old)
Thomas graduated from a university in 2001. In childhood, his dream profession was a farmer, but later he had considered his educational choice in light of his disability. He had been involved in information technology during childhood by playing computer games.
Carl (Postnatal tetraplegia, 58 years old)
Carl graduated in 1988 from a university. The injury did not directly affect the choice of a study field because he had started studying one year before he was injured. After the injury, however, he decided to continue his studies because he was able to work in the ICT sector despite his disability. Carl had not been involved in information technology before his studies.

Sebastian (Postnatal transtibial amputation, 31 years old)
Sebastian was studying the ICT field at polytechnic school. He began his studies in 2007. The completion of the studies had been put on hold because he had started working. He had been injured in 2006, and this had influenced his choice of the place of education. The ICT sector seemed appropriate to Sebastian because the work is sedentary and he had been involved in information technology since the age of 13.

Analysis
This research analysis phase was performed using an inductive approach. Analysis of the individual responses aimed at finding common factors and forming generalizations, and in this way, new knowledge.

The disability had affected eight interviewees in their field of study selection. People expressed that the main reason for selecting this field was because they were able to work in ICT sector positions after graduating despite their disability. Four had completed a university degree and three a polytechnic degree. One of the interviewee’s university studies were pending and one had put polytechnic studies on hold. Three of the interviewees had taken courses at both the polytechnic level and the university level.

Seven interviewees in this study were employed full time and two were searching for a job. During the study, five of the interviewees worked in the private sector, one for the local government sector, and one for a registered association. Three had less than five years of work experience in the ICT sector. Two people had work experience in the ICT industry for more than five years and less than 10 years, and three had more than 10 years of experience in the ICT industry. One of the interviewees had more than 20 years of work experience in the ICT sector. The interviewee’s job titles varied from CEO to a tester's role. It was noticeable that almost all of the interviewees had worked for their most recent employer for a long time. Some had started the job immediately after graduation or even before graduation.

Three of the interviewees said that disability had a negative effect on employment after graduation. For example, during job interviews they had noticed that disability had a negative impact on the employer’s decision. However, all three had found work, and they shared that disability had no effect on the job they got. Six interviewees had not noticed that disability had affected their ability to get a job after graduation. However, one of them shared the following:

*The disability might have affected my employment opportunities if I had spoken about it in a job interview.*

Two people said that they had been able to choose a job because there had been a shortage of ICT experts when they were conducting their job search. Four of the interviewees had received a job before graduation and the other two almost immediately after graduation. One had experienced difficulties in finding employment after graduation. Almost all interviewees emphasized in this context that their own contact network had played a major role in their getting a job. They also said that it is good to create networks with other students and employers while still in school as it makes finding employment after graduation easier.

One of the interviewees said that he would not have gotten his current job without his disability. Three of the interviewees said that the disability had not affected the finding of the next job. The remaining five said that they had not changed their employer since graduation.

Three people mentioned that the employer was aware of their disability before the interview because friends had recommended them or they had been well-known. Three said they had not mentioned their disability in their applications or CV. Three said that they had mentioned their disability in a job application or CV. Two of these three people had tried to apply for a job without mentioning the disability; in these instances, the applications had been answered to more likely. For example, one of them shared the following anecdote:
I applied twice to the same job. The first time, I mentioned in the job application my disability and they did not answer. The second time, I did not mention my disability and they asked me to participate in a job interview.

Two of the interviewees mentioned that they openly spoke about their disability during the interviews. One said that he did not tell about his disability during job interviews. One person did not have experience in job interviews, and the rest of the interviewees said that they finally told about their disability if the interviewer did not ask about it. One said:

I have told potential employers about my disabilities in a job interview if the interviewer did not ask about it.

Two said they had had negative experiences in one or two job interviews, in which case, the injury had affected the behavior of the interviewer negatively. However, they also said that interviewers have been constructive in other job interviews. One had no experience in job interviews. The rest reported that they had not noticed the injury had affected the interviewer's behavior in any way.

One of the interviewees said that the society offered models which support PWD employment and reduce the threshold for companies to employ PWD. He also said that it is good because in this way PWD can show their skills in different companies. Other interviewees did not have experience with these kinds of models and they said that they do not have enough information about such models. They also doubted that the employers have enough information about these kinds of supportive models. For example, one of them said:

The situation is the fact that neither companies, people with disabilities, or social employment services know enough about these models.

One person said that his disability has had a positive impact on the workplace and on the way co-workers react to him. As an example, he said:

Co-workers may have more respect for me because I’m able to act in this world and I can see my disability in a positive light.

One of the interviewees said that the injury might have positively influenced how the co-workers react to him. Others said that the disability had not influenced co-workers in any way.

One said that he needs an assistant’s help in the workplace. Four said that they needed help or assistive devices at work, but the need for help was mainly limited to reaching to goods located high off the ground or that were heavy. The devices that they needed in their work were mainly elevation or rails, which made it possible to carry heavier objects. The remaining four people did not need any special help.

One of the interviewees said that the injury had affected business trips and that it is not easy to make business trips because of the disability. One mentioned that he had sometimes had situations where customers have been shocked at the beginning because of the disability. Later on, the customers’ reluctance had disappeared after they began doing business. Two said that their disability had had a positive impact on the work. For example, one of them said:

Business trip abroad, people come and talk openly because I’m different and they may remember me better because of my disability.

Two interviewees saw that their disability had had a negative impact on the work life; they mentioned that for employers, for example, it is easier to choose a non-disabled employee than a disabled employee to work. Three said that disability had no effect on employment.

All of the interviewees mentioned that they use ICT somehow during their free time, at least to some extent. Use of ICT was mainly limited to social media, Internet-surfing, listening to music, games, and data gathering. However, one of the interviewees said the following during the interview:

I have designed my family house by using 3D software.

The interviewees were also given an opportunity to discuss their ideas regarding how disability had impacted their employment. The following quotations present a few topics that came up in the interviewees’ responses to this question:
It should be able to turn the disability in favor of working life in order to stand out and show a disability in a positive light.

A disabled person should begin to build their work market value during their studies and create a social network with student friends. They should focus on one particular issue, because you're going to work with them in the future.

The responses to this question clearly parallel the research questions presented in this study. The main themes of the responses are that 1) disability impacts the choice of a place to study and 2) how the disability impacts employment and acting in the workplace.

**Main Results**

In this chapter the empirical part of the study and the obtained results are presented. The results of the study are shown in response to the following research question: Do highly educated people with disabilities get jobs in the ICT sector?

**Impact of Disability on Choice of Study Place**

This study showed that disability has a significant impact on the choice of a place to study. In the context of the study, eight of the nine people who we interviewed reported that the disability had at least slightly affected their selection of studies in the ICT sector, although they had had other professions in mind when they had been selecting their places of study. Eight of those interviewed felt that they could work in ICT sector jobs despite their disability because the work was not physically demanding.

**Impact of Disability on Employment in the ICT Sector**

The study revealed that disability had adversely affected the employment of three people immediately after graduation. They had noticed the negative impact of their disabilities in job interviews. Each instance was an individual case; furthermore, they all got jobs later after graduation. Six people said that they had not had any problems finding a job after graduation, but two of the interviewees mentioned that this might be because their graduation time coincided with the boom in the ICT sector. Four of the interviewees were employed even before graduation.

Interviewees who were involved in this study saw that their social network was the main cause for employment after their graduation. They had created a network with other students, employees, and employers while they were still studying.

The study showed that highly educated PWD can be employed in the ICT sector, although some of the interviewees had encountered individual negative attitudes in relation to their disability.

**Impact of Disability on Working in the ICT Sector**

On the basis of this study, disability did not seem to have a negative effect in the workplace. Two interviewees reported that their disability had had a positive impact in the workplace and that they were valued more because they were able to work despite their injuries. The remaining seven did not see that disability had any impact on the work community.

It was also found that nearly all individuals who participated in the study were able to work independently and needed no help. Some needed special tools in the workplace, but the tools were limited mainly to stands or trolleys, which enabled them, for example, to move heavy objects when moving computers from one place to another.

**Discussion and Conclusions**

The aim of this study was to analyze if PWD who have higher education in the ICT field are employed in the ICT sector.

In the first stage, we analyzed previous studies and literature related to this subject. Research data on higher education, the ICT industry, and its employees was fairly available. However, we also discovered that there were very few records of PWD and their higher level studies and employment situation. PWD in employment-related studies were carried out in Finland, for example, by the Ministry of Social Affairs and Health (STM, 2012). Foreign studies on the subject have been conducted to some extent, but they also examined the subject from one perspective that either focused on the employment of PWD or their
university studies, but not a combination of these two. Disability was looked at from the perspective of the work or the studies. For example, Vidacek-Hains etc. (2011) and Andreassen (2012) reported how disabled peopled met challenges in getting a job and in integrating into the workplace.

All nine interviewees were male and they had studied in a polytechnic school or a university in the ICT sector. All of the interviewees had worked in the past or worked at the time of the study in the ICT industry in Finland. All nine interviewees also had some form of physical disability.

An interesting finding was that the interviewees’ social network appeared to be the main cause for employment after graduation. They shared that during their study years they had been networking with other students, employees, and employers.

In light of the interviews with the nine informants, the study showed that the disability did not have much impact on working in the ICT industry. The disability may have slightly affected them, for example, when travelling to work and also in situations that involved interacting with customers. In the late 1990s, Kitchin et al. (1998) reported that PWD may face barriers to access workplaces, especially those who have mobility-related disabilities. However, they also showed that many of those barriers are not too expensive for the companies to remove. They also mentioned that such modifications only require a little flexibility on the part of the employer. On the other hand, one can ask if any flexibility is seen as staff cutbacks have also occurred in the ICT sector (see Jalava & Pohjola, 2007).

Two of the interviewees saw that the disability had had a negative impact on their work life, and they mentioned that for the employers, it is easier to choose a non-disabled employee for work. These interviewees’ thoughts are supported in the literature, for example, by the Ministry of Social Affairs and Health (STM, 2012, p. 45), which reported that the unemployment rate of PWD is significantly higher than that of non-disabled people.

A limitation of this study was the fact that all participants were men and no women’s voices were heard. This was due to the lack of suitable female candidates for the study. This issue can be explained by the fact that women enroll less in ICT studies than men (Siann and Callahan, 2001). The limitation leads to the need for future studies that also include female informants.

The second limitation was that there were only nine interviewees; however, one of the strengths of this study is that the interviewees represented different age groups and the range of physical disabilities was quite wide. On the other hand, the small number of informants might have given too positive a picture about the problem and therefore more research is needed that consists of a larger group of informants.

The third limitation of this study was that employers were not consulted; the viewpoint considered here was that of the disabled person. Again, a more extensive study might also cover the employers’ views.

The fourth limitation was that in earlier research there was no abundant information on the employment situation of high-skilled PWD who worked in the ICT sector. The study has helped to fill this gap.

Further studies could investigate how successfully PWD complete their polytechnic or university degrees. In addition, the work history of disabled people is worth studying. In future research related to this study, it could also be considered how well disabled persons’ salary developed during their career in comparison to non-disabled highly educated workers in the ICT industry.

In addition, future research could examine in more detail how the disability affects the career advancement or change of employers. It would also be interesting to know if there are physical disabilities that prevent a person to work in the ICT sector.

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