Factors Influencing PWD’s Choice of Study in the ICT Field

Jukka Mononen
University of Oulu
jukka.mononen@student.oulu.fi

Raija Halonen
University of Oulu
raija.halonen@oulu.fi

Eija Häyrynen
Tervaväylä unit of the Valteri Centre for Learning and Consulting
eija.hayrynen@gmail.com

Abstract

The purpose of this study was to find out factors influencing the choice of studies of people with physical disabilities (PWD) in the ICT field. It is important to identify these factors because there are a lot of PWD who are eager to gravitate to higher education in the ICT sector. Current knowledge is scarce. The empirical study was implemented with the help of a qualitative research method based on seventeen semi-structured interviews. The study showed that the PWD recognized their physical constraints well and that this had effected a lot when they had chosen ICT field for studies. The study also revealed that the most important factors that influence the PWD’s education and work success were as follows: 1) Disability was seen as a part of personality, not a weakness, 2) Appropriate and interesting career choice, 3) High self-efficacy, and 4) Education success.

Keywords

Disabled people, ICT sector, higher education, social inclusion, support.

Introduction

The purpose of this study was to identify the factors that influence the choice of studies of people with physical disabilities (PWD) in the information and communication technology (ICT) field. The motivation of the study was related to the need of updating the current knowledge about inclusive education that covers all students, with or without disabilities (see Halinen and Järvinen 2008).

There has been discussion why PWD are not widely represented in polytechnics and universities. Hanafin et al. (2007) mention the social structures that inhibit the participation of PWD and lack of positive expectations from the society towards young PWD. In addition, they point out physical access and poor level of awareness as factors that influence an individual’s choice of study. However, Vidacek-Hains et al. (2011) report about an increasing number of PWD who are eager to get higher education. They continue that several institutional resources make it possible to offer higher education also for people with learning difficulties or other disabilities. Work in the ICT sector does not require physical characteristics and many jobs that suit PWD well can be found in the ICT sector.

PWD who use ICT experience independence and empowerment (Stendal 2012). However, Seale et al. (2015) argued that even if disabled students have access to social and cultural resources, these resources are not appropriate or effective and they do not cover all the available resources. As examples of resources, Seale et al. mention school-based ICT qualifications and non-institutional based support or support from other disabled students.

The research topic was put in a question: Which factors influence PWD to choose education in the ICT-field?

The study was conducted with a qualitative research method by semi-structured interviews. The empirical part of the study included interviews of nine Finnish men and eight Finnish women with physical
disabilities. The interviews were written up to transcripts and they were analyzed through an inductive approach. All interviewees had completed a university or a polytechnic degree suitable for the ICT sector or were near graduation. Interviewees’ disabilities varied widely.

The analysis of the interviews showed that a disability had a significant impact on the choice to study in the ICT field. However, for many people, IT had also been a hobby and this had contributed to the decision. The results also identified four factors that influence PWD’s education and work success. The factors are related to the individuals’ self-esteem, interests in a career in ICT, high self-efficacy and education success.

The paper continues by reporting essential earlier knowledge and the empirical research with analysis, it reveals the main results of the study, and ends with discussion and conclusions.

**Prior Research**

Disability as a concept is very wide as reported by Meager and Hill (2005) who studied labor market participation and employment of disabled people.

Schlesinger (2014) brings out the shift in the disability paradigm in the 20th century when the change from the medical model that focused on the impairment in the person to the social model took place in the 1970s. Williams (2001) noted how the International Classification of Impairment, Disabilities, and Handicaps (ICIDH) launched by World Health Organization (WHO) in 1980 included an attempt to see handicap in interaction with the social world.

In 2001 WHO (2013, 4) published the International Classification of Functioning, Disability and Health (ICF) where functioning and disability are conceptualized in the context of health. An individual’s functioning and disability is a result of the interaction between the health conditions of the person and his/her environment. WHO (n.d.) defines the concept of disability related to physical limitations or participation constraints. Disability in this context can mean functional or structural impairment. Participation constraints in this context include those factors that cause difficulties for the individuals to perform tasks or to act in their environment, and before the 1970s, individual physical, behavioral and vocational limitations were preventing PWD from participating fully in a society (Jongbloed et al. 1990).

On the other hand, more knowledge is available and for example Banks and Lawrence (2006) reported in their study that PWD are able to work in non-manual jobs better and longer than in manual jobs.

According to many studies, a number of Europeans with disabilities are able to access information technology (IT) even if ICT is not utilized as much as could be for PWD. Studies also show that attitudes and concepts of PWD towards ICT are different in different countries. (Stendal 2012.) Many of the studies focus only on the positive sides of ICT, but there are also negative aspects which need to be identified. ICT has formed a social phenomenon and without access and appropriate training, PWD can feel exclusion rather than inclusion. (Söderström 2009, cited by Stendal 2012.)

Kaye (2000) pointed out in his study from 1998 and 1999 carried out in the U.S. that PWD have access to a computer at home less likely than people without disabilities and the issue was larger when access to the Internet was taken into account. Later Wentz et al. (2011) argued that accessible versions of ICT are often made available long after the technology already is ready for them or that they are not made accessible at all. In this sense they fear that accessibility will not be implemented even in the long run.

Generally, students who study computer science are seen to be confident around computers and to rely on their computer skills. They seem to have a playful and relaxed relation with computers. They also spend more time using computers. (Beyr et al. 2003.) Siann and Callahan (2001) reported that women choose medical science studies rather than engineering or computer science studies. Beyr et al. (2003) propose that there are two factors why women are underrepresented in computer science studies. Those factors are negative stereotypes toward the sector and low confidence. In addition, ten years later, Clayton et al. (2012) confirmed that even if ICT is increasingly integrated into everyday life, gender stereotypes dominate the ICT and turn female students away from ICT as an occupation. Sáinz and Eccles (2012) add that gender differences in the choice of ICT studies can be reasoned by the influence of self-image of computer ability.
Employment and salary are the most likely reasons that affect an individual's choice of higher education. For example, statistics published in 1997 show that students who graduated from a polytechnic or a university in computer science or engineering and technology science had quite low unemployment rates six months after graduation compared to other sectors such as social, economic and political studies. (HESA1997, cited by Siann and Callahan 2001.) However, Alexander et al. (2011) found that interest in their study included both self-efficacy and outcomes expectations was the most important reason to choose computer science studies.

Globally, it is a growing trend that young PWD enroll to a polytechnic or a university. Among other things, use of ICT, legislative changes, inclusive education practices and an increasing confidence towards young PWD in the society has increased disabled people's participation into the society. More PWD than before feel that by getting a polytechnic or a university degree they can improve their chances to be employed and have independent lives. (Hadjikakou and Hartas 2008.)

The studies of the Rehabilitation Research and Training Center on Disability Demographics and Statistics (StatsRRTC) of people between 18 and 34 years of age showed that in the year 2007, only 15.5 percent of PWD in the US were enrolled in a university or a polytechnic, compared to non-disabled at 25.1 percent. (StatsRRTC 2009, cited by Vidacek-Hains et al. 2011).

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. For example, University of Zagreb has established the Student Affairs Office for students with disabilities where they can get help in study related matters. Based on their experiences, Vidacek-Hains et al. (2011) believe that such learning environments would be valuable in future. Also Dipeolu (2015) emphasize the importance of effective and inclusive career counseling practice because of the difficulties in employment of PWD. On the other hand, Alexander et al. (2011) found that students in the ICT field required less student counselling than those in a non-ICT field.

Smith and Twomey (2002) stated that there are many factors which can explain the weak situation of PWD in the labor market. Factors can be, for example, age, type of disability, socio-demographic characteristics and level of qualification. According to Ali et al. (2011), a low level education may also lead PWD to difficulties in finding a job. In their US based research, Ali et al. (2011) also pointed out that the expectations of PWD who desired a job did not differ much from non-disabled people’s expectations. Especially opportunities for advancement did not differ between different groups.

When studying, the explaining mechanisms of educational career choice in his follow-up study of the educational career choices of a group of youths who finished their compulsory education in 1990 in Finland, Savolainen (2001, 2) asked how to understand the career decision making as an active act of a person and at the same time see it embedded in a social context. Trainor (2008) uses Bourdieu’s (1986) theory of social and cultural capital to inform both the theoretical understanding and the practical approaches to postsecondary transition for youth identified as having disabilities. In Bourdieu’s (1986, 241-258) theory the terms economic, cultural and social capital are essential in the analysis of access to community. The social capital can be memberships, connections and networks in different groups. The cultural capital can be artefacts like pieces of arts or even educational qualifications. The different forms of capital are transmitted within and across generations when people act on different fields.

In the context of education, social capital has its role in creating the human capital in the rising generation. Within the family, social capital needs strong relations, physical presence, time and interest from the parents to their children and relationships to the community. Social capital within the family and outside it showed evidence of considerable value in reducing the probability of dropping out of high school. (Coleman 1988.) The children are surrounded by a web of expectations and this is where the ambition for status attainment arises. That ambition should be linked in the knowledge and resources of the world so that the desired aspirations could come true. (Kim and Schneider 2005.)

Alston and Hampton (2000) noted how both parents and teachers were congruent in their responses about insufficient number of role models for PWD who are interested in science and engineering. They continued that the learning potential and the needs of PWD were not well understood by education professionals. However, on its best, the inclusive school settings offer high educational expectations for all students (McGuire, Scott and Shaw 2006, 170), and the teacher has an important role to support individual learners (OECD 2005).
Smith and Zhang (2009) found that in the transition process from high school to college, the mothers provide the greatest number of helping behavior. They were also the most helpful resource in the transition process, followed by high school teachers, fathers, friends, and high school guidance counselors. Shandra and Hogan (2008) emphasized the role of school-based and work-based transition initiatives for the post-high school employment of youth with disabilities. Lindstrom et al. (2013) examined in their literature review the process of career development for young adults with disabilities who enter the workforce. Strategies to enhance early career development include: a) developing individual attributes and skills, b) broadening the range of careers explored, c) creating initial work experience opportunities, d) obtaining postsecondary education/training, e) providing support to facilitate advancement on the job and f) advocating for changes in the workplace. In the research of Berry and Domene (2015), supportive social relationships, personal resources and material and environmental support were important for postsecondary students with mobility and sensory impairment to reach their career aspirations. Wagner et al. (2014) found that the parents’ expectations of their children’s success in graduating high school were more important than the demographic and disability factors. Asbjørnslett and Hemmingsson (2008) explored in their study how teenagers with physical disabilities experience participation in school. The teenagers emphasized equal opportunities, the possibilities to discuss with teachers and be where the others are.

Empirical Research

This section is divided into three sections. The empirical research data is described first. Then the analysis opens the utilized inductive approach supported by several quotations from the interviewees. The third section reports the main results of this research.

The empirical research sample consisted of semi-structured interviews with eight women and nine men (see Table 1), all of them Finnish. The informants were sought through private networks, via Facebook groups (different kinds of PWD groups) and a couple of national journals published for PWD. Through these means, some interviewees were contacted and some of them told their friends about this research and then they contacted researchers. According to this, we can talk about a small scale snowball effect. The interviews were done in three sets in 2013-2015.

The interview questions were based on the literature review and they 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.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26</td>
<td>Progressive nervous system-derived muscle weakness disease</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>Congenital partial hemiplegia</td>
</tr>
<tr>
<td>Male</td>
<td>31</td>
<td>Congenital amputation of the right leg above the thigh</td>
</tr>
<tr>
<td>Male</td>
<td>31</td>
<td>Postnatal transtibial amputation</td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>Neuromuscular disease</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>Cerebral palsy</td>
</tr>
<tr>
<td>Male</td>
<td>35</td>
<td>Short stature</td>
</tr>
<tr>
<td>Female</td>
<td>36</td>
<td>Cerebral palsy, mainly affecting the lower limbs</td>
</tr>
<tr>
<td>Female</td>
<td>39</td>
<td>Multiple sclerosis</td>
</tr>
<tr>
<td>Female</td>
<td>41</td>
<td>Dysmelia, congenital transtibial amputation and other hand total congenital amputation</td>
</tr>
<tr>
<td>Male</td>
<td>46</td>
<td>Paraplegia</td>
</tr>
<tr>
<td>Male</td>
<td>51</td>
<td>Visual impairment</td>
</tr>
<tr>
<td>Female</td>
<td>56</td>
<td>Congenital deficiencies: high level amputation of both legs and one arm, malformations in the other hand</td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
<td>Short stature</td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>Postnatal tetraplegia</td>
</tr>
<tr>
<td>Female</td>
<td>65</td>
<td>Postnatal tetraplegia caused by polio</td>
</tr>
<tr>
<td>Female</td>
<td>67</td>
<td>Postnatal amputation of the leg above the knee</td>
</tr>
</tbody>
</table>

Table 1. Gender, age and cause of disability
Twenty-one questions related to the interviewees’ disability, studies, and work were asked from the interviewees. Each interview took about 30-45 minutes and they were conducted in Finnish. All the interviews were audio-recorded and transcribed by the first author. All interviewees had been working or were working in the ICT field at the time of the interviews. All of them had completed an ICT field degree or were near graduation.

**Analysis**

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

Within the interviewees, there was a difference regarding the time they had started dealing with computers. There were seven interviewees who had never dealt with the computers before their studies. Four of them were over 40 years of age and had not had the possibility to cope with the computers at their childhood or youth because consumer electronics were not common at the time. There were eight interviewees whose parents had purchased their first computer when they were children and two interviewees who had got interested in ICT during their youth.

**Self-efficacy and family support:** The interviewees were confident about their abilities and success at school. Their school success had been excellent. It had been clear to them to continue their studies after basic education. The families had supported and encouraged them in many ways. They had believed in their capabilities and the opportunities for success.

*I think that high school was the only alternative for me and my big sister— in a positive way. We were good students and high school was a natural choice for us.*

*My family and siblings supported and encouraged me when I went to high school.*

*My parents thought that it was self-evident that I would continue to high school and the school supported also that point of view.*

*I had freedom and responsibility to take care of my studies, but I got “awards” if I got good exam results. I felt that my parents trusted me and thought that I can take care of my own issues.*

In addition to the positive and encouraging attitude, the families had supported their hobbies. The PWD were encouraged to participate in hobbies with other young people outside home. The ability to make friends was valued. If there had been an interest in ICT, the parents had also purchased the first computer for the youngest interviewees even though PCs were rather expensive. Later, in the university years, there was also some financial support and help with issues such as change of an apartment.

**Support from the school:** We also investigated how the PWD felt about their school being concerned about their education. With the help of the society the schools had invested in inclusive school settings, like environment accessibility, assistants, school transportation and remedial teaching if this had been needed. The PWD felt they had been treated and evaluated equally. They had got support from individual teachers, but only little support from study counselors. There were some differences in the teachers’ attitudes depending on the age of the interviewee. In the early 1970’s, it had not been a common idea to provide a good education for PWD although at that time, there had been individual teachers who saw the importance of education for all pupils. In addition, help from their school mates was reported.

*I didn’t get any exemption due to my disability and my studies were graded equally. I think that I didn’t get much study counselling that took into account my disability.*

*Younger teachers supported me to go to high school, more than their older colleagues.*

*They had positive attitude and didn’t doubt my performance, because I was excellent at theoretical studies.*

*To my mind, all people in the school environment, including myself, took my further studies for granted. I didn’t get any special support. It was clear that I would go to the university and I had also my own motivation to that. The study counselor only helped me to pick between the law and technical school.*
I remember that my class teacher who also taught mathematics supported me to go to the high school. One of my long-term class friend came to the same high school with me. That helped me to integrate, because I didn’t have to face new challenges all by myself.

**Dream, network, specialize, think positive and work hard:** The interviewees were asked to tell their message regarding disability, education and employment. The main message was the encouragement to dream and work hard towards those dreams. In addition, specialization and networking skills were seen to be important. Self-respect is a must and the disability should not be seen as a barrier, but rather seen in a positive light.

You should reach towards your own dreams! Practical matters like suitable apartment, personal assistants will work out if you are tenacious.

Disabled persons should begin to build their work market value already during their studies and create social networks with study fellows because in the future they will be collaborating with them. Already at that phase they should focus on one particular matter to stand out from the rest of the work seekers.

Although you have a disability you can succeed in work life. You have to consider yourself equal to others and you should not be ashamed of your disability.

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.

In this study, thirteen interviewees were employed full time, two were searching for a job and two were retired. Interviewees’ working history in the ICT-field varied from a couple of years to 39 years. Several interviewees had over ten years of work experience in the ICT field. Interviewees’ work positions varied from CEO, managers and researchers to testers and specialists.

**Main Results**

This section presents the results of the study in a more detailed form. The results are shown in response to the research question ‘Which factors influence PWD to choose education in the ICT-field?’.

Several factors were identified to influence the choosing of ICT for the education in the polytechnics or universities. These factors were divided into three different groups: Internal, External and Combined factors (see Table 2).

**Internal factors** consist of PWD’s personality characters that were noticed to be meaningful issues in a person’s education and success in work life.

**External factors** consist of outside factors, which have influenced the PWD's life, for example environment, family or/and other people.

**Combined factors** consist of both internal and external factors.

<table>
<thead>
<tr>
<th>Influence</th>
<th>Combined factors</th>
<th>Internal factors</th>
<th>External factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great effect</td>
<td>Disability a part of personality, not a weakness</td>
<td>High self-efficacy</td>
<td>Family support for PWD</td>
</tr>
<tr>
<td></td>
<td>Appropriate and interesting career choice</td>
<td>Education success</td>
<td>Support given by individual teachers</td>
</tr>
<tr>
<td>High effect</td>
<td></td>
<td>Social and networking skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skills to manage own issues and independency</td>
<td></td>
</tr>
<tr>
<td>Medium effect</td>
<td></td>
<td>ICT as a hobby</td>
<td>Inclusive school settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ability to make friends</td>
<td></td>
</tr>
<tr>
<td>Low effect</td>
<td></td>
<td></td>
<td>Support from society</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Study counselling</td>
</tr>
</tbody>
</table>

**Table 2. Factors influencing PWD’s education and work success**

Table 2 described the factors as divided into four different sections based on their influence: Great, high, medium or low effect. The factors and their effects are reported next.
The following four categorized factors that had a great effect were the most important:

**Disability was a part of personality, not a weakness:** The disability itself was not a significant issue for themselves or the people closest to them. The PWD did not see his/her disability as a weakness, but rather as a part of their personality.

**Appropriate and interesting career choice:** It’s very important that PWD’s career choice is based on their own interests. In addition, they also take into account their physical constraints when they choose their occupation. It’s significant that all of the interviewees recognized their own limitations very well. It was remarkable that the closest people in PWD’s environment had encouraged them with their decisions.

**High self-efficacy:** High self-efficacy was an obvious feature of interviewees’ personality. They were very self-confident and trusted their own capabilities. They also took for granted that they will reach a high education and get a good and suitable occupation. Also their families had believed in their children’s abilities.

**Education success:** Almost all interviewees had good education success. If there had been a need for support, they had received it. Some of them had got excellent grades and stipends for their study success already during basic and higher education.

Four factors which had high effect to PWD’s education and work success were found in the study. Those were the following:

**Social and networking skills:** Interviewees saw these skills as very important success factors in education and work life. Because of good social skills, they had been able to create networks that helped them in education and in work life. Many of them had started their network in the childhood through a variety of hobbies. They saw that this was one of the main reasons that they were employed after their graduation. They networked with other students, employees and employers during their studies. It is also noteworthy, that PWD’s families had encouraged them to create these networks with other people.

**Skills to manage their own issues and independency:** In the study, all of the interviewees were very independent. All of them managed everyday tasks on their own and one of them mentioned that she even helped her old parents with their daily tasks.

**Family support for PWD:** The support from the families and siblings to PWD was very clear. Their families had encouraged them to get a high education and a good occupation. Parents had also offered financial help, for example by buying computers and other tools. There was also encouragement from their siblings who had encouraged them to try different things and also been role models to PWD.

**Support given by individual teachers:** The influence of individual teachers was seen to be very important. Individual teachers had encouraged them to continue to higher education. The interviewees remembered their teachers’ support phrases word-by-word after decades.

Some medium effect factors were discovered. It is notable that these belonged to either internal or external factor groups:

**ICT as a hobby:** ICT had been in some way a hobby in their childhood. They had used computers for example for gaming, word processing, drawing or even coding.

**Ability to make friends:** Interviewees saw this as a relevant issue in education. Some of them had made homework together with their classmates.

**Inclusive school settings:** Support from the school was realized for example as weekly remedial teaching in mathematics before the start of high school. In addition, accessibility issues had been taken care of in the school environment. The help of a school assistant was available if needed. The school was not seen as a remarkable supportive community.

In this study the following factors had a low effect, which we found surprising:

**Support from society:** The society related issues like personal assistants, transportation services and environment accessibility were mentioned. However, help from the society was not seen as a major matter regarding their education.
Factors Influencing PWD's Choice of Study

**Study counselling:** Study counselling had only slight impact on the PWD’s education. Although there had been study counselors, they had received only little - if any - guidance from them.

**Discussion and Conclusions**

The aim of this study was to analyze which factors influence PWD to choose an education in the ICT-field. The study was carried out with interviews focused on seventeen PWD whose disabilities varied remarkably. All of them had studied in a polytechnic or a university. The interview data was analyzed using a qualitative content analysis based on an inductive approach.

The most important factors influencing the PWD’s education were as follows: 1) Disability was seen as a part of personality, not a weakness, 2) Appropriate and interesting career choice, 3) High self-efficacy, and 4) Education success. Although the combined and internal factors had more impact than external factors, the significance of the external factors can not be underestimated.

Disability is a wide concept related to physical limitations or participation constraints (Meager and Hill 2005, WHO n.d.). In the current study, the disabilities were physical deficiencies that varied widely, including congenital, postnatal and later forms. In our study, we interviewed eight women and nine men and therefore our study did not reassert research by Clayton et al. (2012), Sainz and Eccles (2012) or Beyer et al. (2003) who pointed out gender issues in the ICT field.

According to Stendal (2012), people who use ICT experience independence and empowerment. In our study, this was verified by the informants who were confident about their abilities and success at school. Stendal continues that being able to participate in education provides experiences of inclusion. The same was verified by an interviewee who described: “I didn’t get any exemption.” Moreover, in our study, disability was seen as a part of the personality instead of a weakness. Also self-efficacy and education success were reasons why our interviewees had chosen appropriate and interesting career choices in polytechnic or university education. Similar findings were reported earlier also by Alexander et al. (2011) who noted that self-efficacy and outcome expectations are important reasons to choose computer science studies.

Hanafin et al. (2007) claimed that social structures and lack of positive expectations from society reduce the amount of PWD in higher education. Later Stendal (2012) noted that attitudes towards PWD differ between countries. Our study showed that the young PWD had experienced strong support from families and individual teachers. Bourdieu (1986), Coleman (1988) and Trainor (2008) write about the importance of families in access to the society. In our study, the support the families had given to their children included encouragement to high achievements such as seeing high school as the only alternative. There had also been a strong belief in the abilities of the disabled child to manage in life. They were surrounded by high expectations from their families, and this is where the importance of social capital was realized. The influence of individual teachers was seen to be very important (see OECD 2005). The teachers had encouraged their students to continue to higher education. Some of the interviewees remembered their teachers’ support phrases word-by-word after decades.

The current study did not support concerns about accessible ICT that were raised by Wentz et al. (2011) who contemplated that accessible ICT for PWD will be implemented after the technology has been available for several years or if it will be available ever. It appeared that some of the interviewees had been able to access ICT already in their early childhood because their families had bought computers for them and this had supported them to choose ICT studies. In this sense, our study did not repeat the findings of Kaye (2000).

Interestingly, even if earlier studies acknowledge the use of career counseling practice due to problems in getting employed or study counselling as such (e.g Alexander et al. 2011, Vidacek-Hains 2011, Dipeolu 2015), the interviewees in the current study rather reported that they had received only little support from the study counselors.

Accessibility was noted to be an issue in earlier research (e.g. Kaye 2000, Hanafin et al. 2011, Wentz et al. 2011, Stendal 2012). However, the informants in our study did not point any significant problems with accessibility during their studies or later at workplaces. Also school transportation and remedial teaching had been provided if needed.
The strengths of this study are in the amount of the interviewees (N=17) and the wide variation of physical disabilities and age. As Smith and Twomey (2002) pointed in their research, age and type of disability are factors that influence lower position in the employment. Our study revealed that PWD's meaningful and interesting career choice had more effect in employment than PWD's age or type of disability. All interviewees had been lucky to find a job quite easily. We didn’t reach PWD who at the time of the study had faced problems in employment in the ICT field. This may be regarded as a limitation of this research. In Finland there is no register about disabled students or employees. Schools, workplaces and registered associations are not allowed to assign any personal data of their students, employees or members. We contacted PWD living in Finland. This might be seen as a limitation of the study.

As the practical contributions the study revealed that physical disability is not a barrier for studies in the ICT field. On the contrary, disability does not matter especially if there is support from family or other related persons of the PWD to enroll into ICT.

The theoretical contributions are seen as the most important factors (Disability was seen as a part of personality, not a weakness; Appropriate and interesting career choice; High self-efficacy; Education success) that were identified to influence choosing ICT field in the studies.

Further studies could focus on work environments of PWD in the ICT field. The research could investigate how work mates, supervisors and customers see the PWD’s role in a workplace. It might be interesting to perform some kind of a case study that includes one or two companies and their actions. Analyzing factors in PWD’s education and employment in an international context could also give valuable information in a global environment.

Acknowledgements

The authors want to express their warmest thanks to all the 17 interviewees who offered their experiences and trust to study this important topic.

REFERENCES


Smith, W. L. and Zhang, P. 2009. “Students’ perceptions and experiences with key factors during the transition from high school to college,” College Student Journal, Part B 43(2), 643-657.


