Article

Digital Differentiation in Young People's Internet Use—Eliminating or Reproducing Disability Stereotypes

Sylvia Söderström

Program for Physiotherapy Education, Department of Health and Social Work, Sør-Trøndelag University College, P.O. 2320, Trondheim NO-7004, Norway; E-Mail: Sylvia.soderstrom@hist.no; Tel.: +47-9243-2888

Abstract: Norwegian authorities' policy aims at securing an information society for all, emphasizing the importance of accessible and usable Information and Communication Technology (ICT) for everyone. While the body of research on young people's use of ICT is quite comprehensive, research addressing digital differentiation in young people with disabilities' use of ICT is still in its early days. This article investigates how young people with disabilities' use, or non-use, of assistive ICT creates digital differentiations. The investigation elaborates on how the anticipations and stereotypes of disability establish an authoritative definition of assistive ICT, and the consequence this creates for the use of the Web by young people with disabilities. The object of the article is to provide enhanced insight into the field of technology and disability by illuminating how assistive ICT sometimes eliminates and sometimes reproduces stereotypes and digital differentiations. The investigation draws on a qualitative interview study with 23 young Norwegians with disabilities, aged 15–20 years. I draw on a theoretical perspective to analyze the findings of the study, which employs the concept of identity multiplicity. The article's closing discussion expands on technology's significance in young people's negotiations of impairment and of perceptions of disability.

Keywords: assistive technology; digital differentiation; disability; identity

1. Introduction

Norwegian authorities' policy aims at securing an information society for all, emphasizing the importance that Information and Communication Technology (ICT) can be used by everybody,

including people with disabilities [1,2]. Achieving this goal involves making ICT accessible and usable according to the individual person's needs and preferences. While the body of research on young people's use of ICT is quite comprehensive, research addressing digital differentiation in young people's use of ICT is still in its early days. This might be due to a common notion that young people are the Web generation and online experts. There is, however, a concern that increasing Internet penetration will exacerbate digital inequalities among young people and that exclusion from digital networks will be one of the most damaging exclusions. This applies especially for vulnerable and marginalized subgroups of young people [3], *i.e.*, young people who are put aside and not accounted for, not recognized and made unessential [4]. One such subgroup of vulnerable and marginalized young people is young people with disabilities [5,6].

While adolescents' socio-economic and cognitive resources shape their use of the Internet, either as an information medium or as an entertainment medium, such differences are less clear-cut for adolescents' use of the Internet as a social medium [7,8]. This article particularly highlights the Internet-connected computer as a social medium, and it illuminates emerging differentiations in this kind of ICT use among young people. This illumination reveals how digital differentiations are created by use or non-use of assistive ICT by young people with disabilities. The investigation elaborates on how anticipations and stereotypes of disability establish an authoritative definition of assistive ICT and the digital consequence this creates for young people with disabilities. The object of the article is to provide enhanced insight into the field of technology and disability by illuminating how assistive ICT sometimes eliminates and sometimes reproduces stereotypes of disability and digital differentiations. Enhanced knowledge about these conditions is of vital importance in providing accessible and usable ICT according to the needs and preferences of young people with disabilities.

A digital differentiation perspective looks into differences and implications of differences in ICT use among those who are perceived to have equal access to ICT [7,9,10]. Digital differentiation is conceptualized as dynamic phenomena, and the adoption and use of ICT is interpreted as a social phenomenon. A digital differentiation perspective usually perceives the characteristics of the users as more important in shaping ICT adoption than the characteristics of the technology. However, the current study finds that for some of the participants with disabilities, the characteristics of the technology itself are vital in providing or inhibiting access to the Internet and thus to participating in the digital information society. In this article I elaborate on how digital differentiations and inequalities are not only social but are also relational, *i.e.*, a mutual interaction between an individual's social characteristics and ICT's technical characteristics. Thus, ICT and the Internet become an intervening catalyst in people`s social sphere.

Before elaborating on these issues, I provide a brief insight into my theoretical point of departure and previous research in the field. Then I describe the current study`s methodological approach before analysing and discussing the study's findings regarding digital differentiation. The article's closing discussion expands on technology`s significance in young people`s negotiations of impairment and perceptions of disability.

2. Background

The potential of ICT in young people`s lives has to be studied in its social envelope, which includes the sets of expectations, contexts, and social practices that surround it. Virtually all young Norwegians are active computer and Internet users. The majority, 91 per cent, frequently engage in online communication, mainly with offline friends and acquaintances [8,11]. Online communication and surfing the Internet for fun and leisure are the most popular digital activities among young people in general [12–14]. A comprehensive body of research finds that young people's use of online communication and online activities are highly integrated into their offline relationships; it also finds that the real and the virtual are no longer separate worlds but are permeable and influential upon each other [15–17]. Former socio-economic differences related to ICT have evened out during the last years, especially when it comes to the Internet as a social medium [3,7,14]. However, young people are expected by their peers to be digitally connected, and if they are not, they are not able to participate in their peers' communities [13,17,18].

Previous research on people with disabilities and ICT has mainly focused on adults' perceptions and use of ICT [19–21]. Past work in this area illuminates how adults with disabilities, especially those who have a hard time meeting other people, benefit from online self-help groups and disability-related websites. Even though disability and kinship remain the principle bond online, the possibilities offered by the Internet have great personal significance for many people with disabilities [21–23]. In line with other studies that find age to be the most consistent difference in use of ICT [8,16,23], this article illuminates a different picture of ICT's impact on young people with disabilities.

The Norwegian government uses two different strategies to promote access to ICT and ICT assistive technology for people with disabilities. The first strategy, which emphasises the universal design of ICT, has focused thus far on public websites, open standards, and open sources [24]. The second strategy is a rights-based national assistive technology diffusion system. Every Norwegian county houses an Assistive Technology Centre that provides assistive technologies, free of charge, to people whose ability to function in everyday life is considerably and persistently reduced. These centres provide assistive technology solutions for people of all ages for use at home, school, work, or leisure. Common ICT assistive technologies include various hardware and software, ICT tools, and equipment for handling the computer and communication aids [25].

Assistive technology may be defined as any item, piece of equipment, or product that is applied to secure, increase, maintain, or improve functional capabilities [26]. Moreover, assistive technologies are technologies used to improve, expand, or extend people`s performances, actions, and interactions, and thus they are often experienced as an extension of the body [25–27]. This implies that using assistive ICT involves more than overcoming environmental barriers. Assistive technologies are loaded with collective cultural traditions, symbols, and values, and subjective feelings and meanings assigned the technology [26,28]. While young people find use of ICT to symbolize competence, belonging, and independence, they find use of assistive ICT to symbolize restriction, difference, and dependency [29]. This contradiction makes the combined use of ICT and assistive ICT of special interest to the cross-disciplinary field of disability and technology studies.

3. Theoretical Point of Departure

The current study is one in the cross-disciplinary field of Nordic Disability Studies and holds a relational perspective on disability. This relational perspective conceptualizes disability as a social construction, which takes place in interpersonal relationships and in encounters between individuals and environments, as well as between individuals and society [30]. Thus, it is not impairment that makes young people disabled or that governs their use of ICT, but rather barriers, or opportunities, in interpersonal and social encounters, in relationships and in experiences that make them disabled [31].

Furthermore, this article perceives use of the Internet as a tool in identity negotiations for young people with disabilities [22,32]. To analyze the impact of this tool, a theoretical perspective on the significance of identity is mobilized. This perspective focuses on socially ascribed identities and individually chosen identities, and it employs the concept of *identity multiplicity* [33].

Identity Multiplicity

In this article I draw on the following definition of identity: "*Identity* is a concept that holds together two quite distinctive dimensions. On one level it means identification with something *collective, cultural, and social.* On the other it denotes a sense of *self* and a sense of *continuity* within that self [33]."

This first level is given voice through the socially ascribed identity, where the identification is determined by collective, cultural, and social discourses. Having an ascribed identity as disabled implies that the person is not anticipated to hold other identities [4,6]. Many people with disabilities, however, protest this perception and strive towards changing their ascribed identity [5,6]. The second level is expressed through an individually chosen identity, where the identification is based on personal preferences and is expressed through self-presentations. Post-modern identities are identities undergoing constant changes, where the emphasis is put on the individual identity [5,34]. Even though identity can be viewed as a concept involving an on-going project in constant change and revision, the liquidity and mobility of this project is not as apparent for people with disabilities as for people without disabilities [34]. People's individual choices are, however, not arbitrary; they are choices available in social and cultural structures, in relationships, and in contexts. Moreover, individually chosen and socially ascribed identities often interrelate and are part of a dynamic interplay; they may be in opposition to each other or mutually reinforcing and compatible [5].

While the debate in mainstream youth literature is influenced by metaphors of an identity's liquidity and mobility, young people with disabilities have been given a separate status and referred to the therapeutic field, which focuses on biological status as a barrier to identity experimentation [34]. In this article, however, young people with disabilities are perceived as first and foremost ordinary young people who have the same desires, aspirations, and needs for companionship, recognition, and belonging as any other young person.

4. Methodological Approach

This article draws on a qualitative interview study with a sample of 23 young Norwegians with disabilities (11 girls and 12 boys) aged 15–20 years (see Table 1). Among these young people, 12 have

mobility difficulties (3 girls and 9 boys), and 11 of them are partially sighted or blind (8 girls and 3 boys). These two groups of participants were chosen due to previous research which has found ICT to be quite accessible to people with mobility difficulties but rather inaccessible to people with visual difficulties [35]. This anticipates that ICT represents different opportunities and barriers to these two groups of young people and that this might provide a nuanced knowledge into the participants experiences. This anticipation is partly confirmed in the current study. The exception is for those participants (two girls and three boys) having mobility difficulties in their upper limbs, such as fine motor difficulties which complicated the operation of a keyboard.

All participants belong to ethnic Norwegian families and have similar socio-economic backgrounds. The participants were recruited anonymously through public assistive technology centres, public resource centres, and user organisations. They all received an information letter with a consent form that was sent out by the different centres. Those who wanted to participate filled out the consent form and returned it to the researcher. Thus, the researcher did not know who received the invitation to participate, and the different centres did not know who consented to participation. For those participants under the age of 18, the parents also gave their consent. The participants had all been allocated a personal computer and several assistive ICT devices as assistive technology. The research study was registered and approved by the Norwegian Social Science Digital Register (NSD).

Table 1. Participants in the study.

No.	Participants who are blind or partially sighted	Participants with mobility difficulties, All using a wheelchair—some also having fine motor problems
1	Eve (girl) 15 years, partially sighted	Lisa (girl) 15 years old, fine motor problems
2	Stig (boy) 15 years, partially sighted	Jacob (boy) 16 years old
3	Helene (girl) 15 years, partially sighted	Lars (boy) 16 years old
4	Sara (girl) 16 years, blind	Martin (boy) 16 years old
5	Mari (girl) 16 years, partially sighted	Kristin (girl) 16 years old, fine motor problems
6	Jon (boy) 16 years, partially sighted	Tore (boy) 17 years old, fine motor problems
7	Gerd (girl) 17 years, blind	Kenneth (boy) 17 years old, fine motor problems
8	Iselin (girl) 17 years, blind	Harald (boy) 18 years old, fine motor problems
9	Maren (girl) 17 years, blind	Christopher (boy) 18 years old
10	Eivind (boy) 17 years, partially sighted	Øyvind (boy) 19 years old
11	Maya (girl) 18 years, partially sighted	Christine (girl) 19 years old
12	-	Heine (boy) 20 years old

The qualitative interviews were semi-structured and took place as face-to-face conversations about the significance of ICT in the participants' everyday lives, friendships, and social relationships. The interviews were conducted by me, an adult female researcher. As a preparation I performed two pilot interviews, one with a girl and one with a boy, both in their late teens. This was partly to try out my questions and word choice but also to get a closer insight into young people's digital everyday life. Being an adult woman with no other relations to the participants than this research interview, I tried to facilitate an open conversation and acknowledge the experience of each participant. The research interviews with the participants lasted approximately one hour, and the only technology involved during the interviews was the tape recorder used to record the interviews for later transcription.

The interview transcriptions were analysed following the principle of a constructivist grounded theory approach, using a constant comparative method [36,37]. The interviews were read and re-read in order to identify and name patterns, concepts, and categories. Each interview was first analyzed on an individual level and then compared across subjects to identify patterns and common categories. This was done by employing open, axial, and selective coding. Open coding involved comparing and contrasting initial patterns to uncover and name preliminary categories and their properties. During axial coding, the relationship between categories was analysed and linked to subcategories. The selective coding integrated and refined the categories [37]. Then, a new search for typical data extracts, validated for their context and meaning, was performed to articulate central insights from each category. In this paper I report on the findings related to digital differentiation, which is when the participants encountered barriers in their use of ICT that led to an exclusion from digital interaction with peers.

5. Findings and Discussion

Using ICT and assistive ICT is more than overcoming practical or environmental barriers in communication and social interaction. It is even more significant as a means of representing identity and as a strategy of distinction. In this strategy of distinction, the significance of "being ordinary" [4] stood out as the most important. Sometimes the assistive ICT assigned to the participants did not work as it should, sometimes it was not compatible with the ordinary ICT, and sometimes it was rejected by the participants due to its inherent symbols of restriction, difference, and dependency [29]. The question is what the consequences of these things are for young persons with disabilities' possibilities in negotiating identity and participating in the digital arena. The findings reported on in this article are illustrated with some extracts that were found to be typical for the experiences and statements of the participants.

5.1. When Things don't work

One of the participants is Lisa, a 15-year-old girl with severe mobility difficulties. She uses a lot of assistive ICT, and she frequently experiences errors and shortcomings with the assistive ICT. For writing Lisa is assigned the assistive technology BigKeys, which is an enlarged keyboard for the computer. Lisa enjoys writing, she expresses herself very well, and she wants to become an author. However, due to quite a bit of involuntary upper limb movements, it is strenuous for her to control her finger movements to hit the right key, even the BigKeys. Consequently, she needs a lot of time to solve writing tasks. These tasks are really are quite simple for her, but it is exhausting for her to work on the computer for extended periods of time. Talking about writing, she explained:

> "When the letter 'A' is not working I get quite annoyed. The lack of this little 'A' gives me problems in chatting with friends and I miss out on a lot of what is going on. The assistive technology equipment just has to work. Why do they not check this out at the assistive technology centre before delivering it? Do they not expect me to need the letter 'A', what do they think I use the computer for? It is vital that all the assistive ICT just work all the time."

Here Lisa describes how little strokes fell great oaks and what consequences this may have. An assistive technology's usability is reflected by its impact on the user's activity and social participation [38]. To obtain a high level of usability, assistive technology must reduce physical, cognitive, and linguistic efforts and promote convenience, efficiency, and productivity. Even more importantly, it must support a positive impression of the user on significant others.

Another participant is Eve, a 15-year-old girl with severe visual impairment. Eve is very outgoing, and she is allocated a screen magnifier software application for her computer. As long as the assistive ICT works, all goes well, but as soon as something does not work, everything falls apart. Eve depends on her assistive ICT tools in all her digital activities. When an error occurs on the assistive ICT, the assistive technology centre is responsible for repairs [39]. Eve says:

"It feels like it takes years from the time we send in the assistive equipment to the assistive technology centre until it is repaired. In the meantime, I must do without this equipment, and this has major consequences for my social life. I get so tired of waiting for the assistive technology centre to do their job. And it's a little hard to complain, too, because I am really grateful for all the help I get. But it is so much that is missing, and I am totally dependent on them."

That things take time is something most of us have experienced, especially where multiple agencies have to collaborate on complex matters. This also applies to the dissemination and maintenance of assistive ICT equipment. This is confirmed by many users of this sort of equipment and by various service providers in the municipalities. The information about what happens along the way, where the equipment is, and how long it takes before it is repaired or something that is missing is replaced is especially important [39]. Many young people with disabilities depend completely on their ICT tools to work at any time in order to be digitally connected. When the parents of these young people have to take responsibility and make calls to check and nag, it is frustrating and tiring for both the parents and the young persons. They also find it a dilemma to complain about a service they are not happy with but which they are totally dependent on and thankful for.

Assistive technologies that do not work as anticipated or needed create frustrations that often lead to the rejection of the technologies [28,38]. Children and young people have an especially low tolerance for technical errors or shortcomings that hamper their self-presentation or interactions with peers [29]. When they encounter such technological barriers the participants feel that their impairment is placed on the front stage [4]. When I ask Tore, a 17 year old boy with mobility difficulties, what he thinks about the BigKeys he is allocated he answers;

It is alright when it works. But when it doesn't work I easily get annoyed. Then there are so many spelling errors, and people think I can't spell because I am disabled when it really is the BigKeys that doesn't work.

When such technological barriers occur, they experience that their peers easily jump to the conclusion that this is due to their impairment and not due to technological shortcomings, implying that they cannot do the same things as their peers due to their impairment. Consequently, they feel that assistive ICT holds inherent stereotypes of disability, such as restriction, difference and dependency, and thus marks them as disabled. Many of the participants thus avoid using assistive technologies, especially in their interactions with classmates and peers. As long as they have a choice, most of them will choose to manage without using assistive ICT because they experience the use of assistive ICT as

stigmatising, which is being described as a different and less valued identity as disabled, rather than their individual chosen one. However, many of these children and young people do not have a choice if they want to participate and be included in the peer group.

5.2. Incompatible Assistive ICT

Sometimes the assistive ICT works just fine, and the ICT works just fine, but put together they are not compatible, at least not for the purposes the user wants. Gerd is a 17-year-old girl with a keen interest in computers who spends most of her leisure time at her computer. Gerd is blind and has been allocated a computer with a Braille display, a screen reader, and a speech program. Thanks to these assistive ICT devices, the computer and the Web are accessible to her. When I ask Gerd if she ever has trouble operating the computer, she offers the following reply:

> "Well, not everything is accessible with screen readers. There is this website by an artist I like a lot, but it is not accessible with Braille display. There are really a lot of websites that are not accessible with Braille display, like YouTube and stuff. At school my friends ask me: 'Have you watched the fun new video on YouTube?' And I go like: 'What? How can you watch it?' Then they tell me the Web address, but: Oh, no it does not work with the software application for my Braille display. The worst thing is that they might think it is me that knows nothing about computers."

In order to participate in her friends' discussions about cool videos on the Web, Gerd needs to know these videos. Somehow she must be enabled to see, experience, or sense what these videos are all about. A number of actors must be mobilized and have to connect in complex networks in order to give Gerd the opportunity to experience these videos. In addition to the usual network of connections that is needed in order to log onto the Web, this network also has to be compatible with Gerd's various assistive ICTs. These assistive technologies have been assigned to make her computer and the Web accessible to her. However, when Gerd tries to log on to YouTube, she finds that her assistive ICTs do not work as intended. The question is then whether the assistive technology is inadequate or the adaptive interface is incompatible with her screen reader. Is it possible to provide digital accessibility, in every respect, for everyone at the same time? Moreover, who would be responsible to ensure universal design and equal accessibility in a global setting, such as the Internet, holding both public and private parties? This limitation in accessibility results in the exclusion of many visually impaired young people from participation in their peers' joint experience with YouTube and other websites containing graphical content, and, thus, from meaningful participation in vital parts of their peers' social interactions. In these interactions, young visually impaired people are placed outside their peer group's fellowship, identified as deviant, and given an ascribed social identity as disabled. Thus, due to incompatible technology, young people with visual impairments are excluded from many popular websites, leading to a digital divide in the peer group.

What occurs in this particular situation when Gerd tries to access YouTube is a break in the network's many connections, an error that blocks Gerd's ability to present her individual chosen identity as a computer-skilled young person. Gerd describes the blocked connections as inaccessible websites. These inaccessible websites are obstacles to Gerd's opportunity to present her chosen self-identity, and they lead to digital differentiations in her peer group. In the current study, the blind

and the partially sighted participants describe numerous encounters with inaccessible ICT and unusable assistive ICT. Unusable assistive ICT does not mean that the assistive ICT cannot be used; it means that the technology cannot be used for the purposes these young people want to use them for. Such purposes are digital interactions with friends, most often on websites containing graphics.

This case illuminates the intertwined and mutually permeable nature of the virtual and local arenas, and it shows how obstacles in one arena also affect the other. Being able to participate in local settings with friends is vital to young people's opportunities in their identity negotiation. However, in Gerd's conversation with her friends about YouTube, she encounters obstacles to her identity negotiation as effects of inaccessible ICT and useless assistive ICT. Gerd is thus excluded from her peers' social interaction and risks being defined as different and as disabled due to technical shortcomings, which lead to digital differentiations.

Most people, and probably also Gerd's friends, do not expect blind people to watch YouTube or surf the Web. Thus, Gerd is probably not expected to be able to take part in conversations about YouTube and the Web. Anticipations about what a person with disabilities can and cannot do are often determined by a notion of disability as an individual and medical condition, leading to a perception that the disability constitutes a person's primary status, thus neglecting their other properties [4,6]. Social anticipations about what a person with disabilities can and cannot do cause many young people with disabilities to work harder than others to prove their capabilities and competencies, even when these capabilities and competencies have no connection with their impairments. The next section will illuminate how such social anticipations may cause digital differentiations in a peer group.

5.3. Inherent Symbols of Assistive ICT

Using assistive technology involves more than overcoming environmental barriers; it is also a means of communication that represents identity and a strategy of distinction [40]. When using technology people express their personal and social characteristics, and through their use of technology people make assumptions about each other's identity and belonging [41]. Thus, the adoption or rejection of assistive technology is best understood in the light of its impact on identity.

Sometimes it appears that even if the assistive ICT tools do work, they are too burdensome to use. This is expressed by Eivind, a 17-year-old partially sighted boy. He has been allocated a screen magnifier for his computer. Eivind's experience with the screen magnifier is quite similar to those of other partially sighted participants. When we talk about assistive ICT, Eivind says:

> "I have never actually used the screen magnifier. It's too much hassle about it, and it does not always provide access anyway. I can't be bothered getting used to it. I manage without it. Maybe I will use it when I get older."

Eivind explains how the screen magnifier splits up texts and graphics, making it difficult for him to get an overview, and causing him to take more time and effort to perform even the simplest tasks. Thus, Eivind finds it difficult to keep up with the speed of his friends' online interactions when they play computer games. Eivind says he often delays the game's progress when he uses the screen magnifier. This delay emphasises his impairment and makes him feel both different from his friends and more dependent on their patience. Encountering such technological barriers causes young people

with disabilities to feel that their impairment is placed on center stage, and this is something they strongly want to avoid.

Eivind manages to play computer games without the screen magnifier. However, doing so involves some visual challenges, such as regularly missing vital graphic information. Even so, Eivind prefers to struggle with the ordinary visual interface, which he experiences as less confusing than the screen magnifier. The social cost to Eivind of rejecting the screen magnifier is that he is a less accomplished game player. Nevertheless, he prefers to be identified as an ordinary friend and poor game player, rather than as a deviant friend and disabled game player who is dependent on the good will of his friends.

A predominant issue for young people with disabilities is the significance of being ordinary. A profound tension exists between the symbols of ordinary youth and those linked to disability, just as there is between mainstream and assistive technology [42]. While youth is commonly perceived to symbolise hope, vigour, and strength, disability is commonly perceived to symbolise tragedy, invalidity, and frailty [34]. Moreover, when young people perceive of certain technology as outside the range of the normal, or if the technology overtly bespeaks of impairment, using this technology has to be either disguised or negated. When using assistive technology is an option but not an "enforced choice," young people's definitions of what constitutes normality seem to be the principal factor in determining whether or not they are willing to use the technology [40]. Eivind's remark about "when I get older" may imply either that he perceives sight-enhancement devices to symbolise old age, or that the difference and dependency it symbolises may be easier to live with when he is older.

Two other partially sighted participants, Stig and Jon, also deemed the ICT assistive technologies unsuitable. Stig, who is 15 years old, says that he prefers to enlarge the characters on the screen in the ordinary way, "like everybody else," and Jon, who is 16 years old, does not think he needs the ICT assistive technology. Thus, they negate the significance of impairment and emphasise the importance of using ICT in an ordinary way. Even though screen magnifiers provide partially sighted persons with better access to the visual interfaces of the web, five out of seven partially sighted participants in this study completely rejected the screen magnifiers assigned to them. The reason they gave for their rejection of the ICT assistive technology was its unsuitability for digital interaction with peers. When they describe their experiences with the ICT assistive technology, feelings of restriction, difference, and dependency emerged. These feelings were reflected in expressions that typified their perceptions of the ICT assistive technology: "too much bother," "no point," and "stupid," "difficult," "boring," and "annoying". Not surprisingly, the vocabulary of young people differs from that of adults and academics. Their expressions reflected a sense of assistive ICT as drawing attention to restriction, difference, and dependency, characteristics that were associated with a medical understanding of disability and with an identity as deviant [40]—an identity that was rejected by all the participants in the study.

Other participants, such as the blind participants, who are dependent on a screen reader, and those with upper limb movement difficulties, who is dependent on the keyboard BigKeys, do not have the luxury of rejecting assistive ICT if they want to participate in the community of their peers. The importance of this participation forces them to adopt the assistive ICT. Even though using assistive technology identifies them as disabled, it is also their only opportunity to participate and

display their individually chosen identity. This opportunity seems to overshadow the risk of being identified as disabled.

Disability is not an issue for the participants; their impairment is a natural part of their everyday lives. When questioned directly about how they experience their impairment, they typically answered: "I do what ordinary people do, hang out with friends," "It's nothing," and "I just talk to my friends like everybody else about everyday stuff." As for most young people, it is very important for young people with disabilities not to stand out as different from their peers [6,43]. In discussing impairment, the reticence these participants demonstrate is not uncommon for young people with disabilities [40,44]. The participants do not perceive themselves as different from other young people just because they happen to be partially sighted or blind or have mobility difficulties. Like many young people with disabilities, the participants construct their self-identity in such a way that impairment is negated as an identifier [45]. These young participants demonstrated how using ICT involves more than accessing technical equipment: of equal importance is using the appropriate technology and the way in which it is used. Thus these young people with disabilities preferred being poor ICT users to being disabled ICT users.

Young people with disabilities find themselves caught in a bind between concealment and disclosure. In a culture of consumption, the symbols of youth and disability exist in a relationship of profound tension, as do the symbols of ICT and assistive technology. While youth symbolises potency, vigour, and strength, disability symbolises restriction, difference, and dependency [29,34,40]. Thus, youth and disability, like mainstream ICT and assistive ICT, constitute two very distinct and incompatible identities that clash with and recoil from one another [34]. This age-related incompatibility makes it even harder for young people with disabilities to negotiate a preferred self-identity. Even though using assistive ICT may ease their access to ICT and their participation in the peer group, using assistive ICT also discloses their impairment. This disclosure makes them feel portrayed as deviant and disabled, an identity from which they distance themselves. Young persons with disabilities are routinely confronted with this dilemma of concealment or disclosure as they find themselves forced to trade maximal social inclusion by using mainstream ICT for improved empowerment and participation by employing assistive ICT.

6. Conclusions

The majority of young people adopt and use any communication tool at their disposal, and their use of the Internet is increasingly communicative—it is a place to build networks, display identity, and interact socially [12–14]. This creates a permeability of the local and the virtual and a dependency on accessible and usable technology.

For many young people with disabilities, this permeability also involves a dependency on accessible assistive technologies that can enable interaction with peers, regardless of time and place. The allocation of assistive technology may, however, give rise to the confident assumption that the aim of access is achieved when assistive technology is provided. This confidence may lead to a neglect of the reality young people with disabilities find themselves in and leave them at a dead end. Consequently, one may be fooled to believe that ICT serves as a facilitator to even out digital differentiations, when it actually becomes a facilitator of the opposite.

Most assistive technology is reactive in design, and mainstream technology has moved another step forward by the time accommodations are made. If mainstream technology was universally accessible right away, the gap in time between the availability of new technology and the availability of suitable assistive could be avoided [46,47]. However, despite its benefits, universal design is not a panacea for making ICT accessible for people with disabilities. The complexity of a digitalised environment and differences in how people access and use ICT may represent an unsolvable problem for the goal of universal design. Thus, the continuous development of usable assistive technology is both necessary and complementary to universal design, and this development needs to be more innovative and proactive in its approach [47]. Moreover, assistive technology's impact on the user's self-identity needs to be carefully considered by both the developers and the providers of assistive technologies.

This article provides an enhanced insight into the social conditions that lead to digital differentiations between young people with and without disabilities. The most significant of these conditions relates to the importance of being perceived as ordinary young people and being able to participate in their peers' community. The findings underline the importance of the relationship between universal design and assistive technology and their compatibility. Assistive ICT will always assist ordinary ICT that already exists. The challenge is to make assistive ICT flexible enough to be innovative and proactive and to carefully consider this technology's inherent symbolic values and their impact on identity. This article has illuminated how small technological errors, incompatible technologies, and the use of assistive ICT may put impairment on center stage and thus reproduce stereotypes of disability as restriction, difference, and dependency.

This study draws on a small qualitative sample, and the empirical images it generates may not necessarily be representative for all young people with disabilities. However, I believe it to be both reasonable and plausible that the elaborated empirical images discussed here may be of relevance for other young people with disabilities living in similar affluent societies and social contexts. A more comprehensive investigation into what makes young people with disabilities adopt or reject assistive ICT is required. Moreover, further research in this field needs to investigate how assistive ICT might become more easily adaptable to the requirements of individual users.

Acknowledgments

References

1. *e-Norge 2009—Det Digitale Spranget* [in Norwegian]; Moderniseringsdepartementet: Oslo, Norway, 2009.
2. Report No. 17 to the Storting. In *Eit Informasjonssamfunn for Alle* [in Norwegian]; Det Kongelege Fornyings- og Administrasjonsdepartementet: Oslo, Norway, 2006.
3. Livingstone, S.; Helsper, E.J. Gradations in digital inclusion: Children, young people and the digital divide. *New Media Soc.* **2007**, *9*, 671–696.
4. Goffman, E. Stigma. Notes on the Management of Spoiled Identity; Penguin: London, UK, 1963.

5. Barron, K. I am, and I am Not: Identity, a Multifaceted Concept and Social Phenomenon. In *Resistance, Reflection and Change: Nordic Disability Research*; Gustavson, A., Sandvin, J., Traustadòttir, R., Tøssebro, J., Eds.; Studentlitteratur AB: Lund, Sweden, 2005; pp. 163–176.

6. Grue, L. *Motstand og Mestring Om Funksjonshemming og Livsvilkår* [in Norwegian]; Abstrakt Forlag: Oslo, Norway, 2001.

7. Peter, J.; Valkenburg, P.M. Research note: Individual differences in perceptions of Internet communication. *Eur. J. Commun.* **2006**, *21*, 213–226.

8. Vaage, O.F. *Norsk Mediebarometer 2007* [in Norwegian]; Statistisk Sentral Byrå: Olso, Norway, 2008.

9. Sassi, S. Cultural differentiation or social segregation? Four approaches to the digital divide. *New Media Soc.* **2005**, *7*, 684–700.

10. Yu, L. Understanding information inequality: Making sense of the literature of the information and digital divides. *J. Librariansh. Inf. Sci.* **2006**, *38*, 229–252.

11. Storsul, T.; Arnseth, H.C.; Bucher, T.; Enil, G.; Horntvedt, M.; Kløvstad, V.; Maasø, A. *Nye nettformer Staten og delekulturen* [in Norwegian]; Institutt for Medier og Kommunikasjon: Oslo, Norway, 2008.

12. Kaare, B.H.; Brantzæg, P.B.; Heim, J.; Endestad, T. In the borderline between family orientation and peer culture: The use of communication technologies among Norwegian tweens. *New Media Soc.* **2007**, *9*, 603–624.

13. McMillan, S.J.; Morrison, M. Coming of age with the Internet: A qualitative exploration of how the Internet has become an integral part of young people's lives. *New Media Soc.* **2006,** *8*, 73–95.

14. Räsänen, P.; Kouvo, A. Linked or divided by the web? Internet use and sociability in four European countries. *Inf. Commun. Soc.* **2007**, *10*, 225–245.

15. Buckingham, D. Children and New Media. In *The Handbook of New Media Updated Student Edition*; Lievrouw, L.A., Livingstone, S., Eds.; SAGE: London, UK, 2006.

16. Livingstone, S. Children's use of the Internet: Reflections on the emerging research agenda. *New Media Soc.* **2003**, *5*, 147–166.

17. Valentine, G.; Holloway, S.L. Cyberkids? Exploring children's identities and social networks in on-line and off-line worlds. *Ann. Assoc. Am. Geogr.* **2002**, *92*, 302–319.

18. Lievrouw, L.A.; Livingstone, S. Introduction to The Updated Student Edition; In *The Handbook of New Media Updated Student Edition*; Lievrouw, L.A., Livingstone, S., Eds.; Sage: London, UK, 2006; pp. 1–14.

19. Anderberg, P.; Jönsson, B. Being there. *Disabil. Soc.* **2005**, *20*, 719–733.

20. Houlihan, B.V.; Drainoni, M.L.; Warner, G.; Nesathurai, S.; Wierbicky, J.; Williams, S. The impact of Internet access for people with spinal cord injuries: A descriptive analysis of a pilot study. *Disabil. Rehabil.* **2003**, *25*, 422–431.

21. Seymour, W. ICTs and disability: Exploring the human dimensions of technological engagement. *Technol. Disabil.* **2005**, *17*, 195–204.

22. Cummings, J.N.; Kiesler, S.B.; Sproull, L. Beyond hearing: Where real-world and online support meet. *Group Dyn. Theory Res. Pract.* **2002**, *6*, 78–88.

23. Seymour, W.; Lupton, D. Holding the line online: Exploring wired relationships for people with disabilities. *Disabil. Soc.* **2004**, *19*, 291–305.

24. Fossestøl, K. A Policy for Social Integration. ICT Strategies, Employment and Disability in the United Kingdom, the Netherlands, Denmark and Norway. In *Stairway to Heaven? ICT-Policy, Disability and Employment in Denmark, the Netherlands, United Kingdom and Norway*; Fossestøl, K., Ed.; Work Research Institute: Oslo, Norway, 2007; pp. 1–10.

25. Hansen, I.L.S. ICT Policy in Norway—Disability and Working Life. In *Stairway to Heaven? ICT-Policy, Disability and Employment in Denmark, the Netherlands, United Kingdom and Norway*; Fossestøl, K., Ed.; Work Research Institute: Oslo, Norway, 2007; pp. 27–39.

26. Wielandt, T.; McKenna, K.; Tooth, L.; Strong, J. Factors that predict the post-charge use of recommended assistive technology (AT). *Disabil. Rehabil. Assist. Technol.* **2006**, *1*, 29–40.

27. Lupton, D.; Seymour, W. Technology, selfhood and physical disability. *Soc. Sci. Med.* **2000**, *50*, 1851–1862.

28. Pape, T.L.B.; Kim, J.; Weiner, B. The shaping of individual meanings assigned to assistive technology: A review of personal factors. *Disabil. Rehabil.* **2002**, *24*, 5–20.

29. Söderström, S.; Ytterhus, B. Visually impaired young people's use and non-use of information and communication technology's assistive technologies: A walk on the tightrope of peer inclusion *Disabil. Soc.* **2010**, *25*, 303–315.

30. Gustavsson, A.; Tøssebro, J.; Traustadòttir, R. Introduction: Approaches and Perspectives in Nordic Disability Research. In *Resistance, Reflection and Change: Nordic Disability Research*; Gustavsson, A., Sandvin, J., Traustadòttir, R., Tøssebro, J., Eds.; Studentlitteratur AB: Lund, Sweden, 2005; pp. 23–44.

31. Söderström, S. The significance of ICT in disabled youth's identity negotiations. *Scand. J. Disabil. Res.* **2009**, *11*, 131–144.

32. Baym, N.K. Interpersonal Life online. In *The Handbook of New Media Updated Student Edition*; Lievrouw, L.A., Livingstone, S., Eds.; SAGE: London, UK, 2006; pp. 35–54.

33. Krange, O.; Øia, T. *Den Nye Moderniteten Ungdom, Individualisering, Identitet og Mening* [in Norwegian]; J.W. Cappelens Forlag AS: Oslo, Norway, 2005.

34. Hughes, B.; Russell, R.; Paterson, K. Nothing to be had "off the peg": Consumption, identity and the immobilization of young disabled people. *Disabil. Soc.* **2005**, *20*, 3–17.

35. Hansen, G.S.; Winsvold, M. *Lokalt e-Demokrati Om Elektronisk Deltakelse Blant Innbyggere med Funksjonsnedsettelse* [in Norwegian]; Norwegian Institute for Urban and Regional Research (NIBR): Oslo, Norway, 2006.

36. Mills, J.; Chapman, Y.; Bonner, A.; Francis, K. Grounded theory: A methodological spiral from positivism to postmodernism. *J. Adv. Nurs.* **2007**, *58*, 72–79.

37. Strauss, A.; Corbin, J. Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory; Sage: London, UK, 1998.

38. Arthanat, S.; Bauer, S.M.; Lenker, J.A.; Nochajski, S.M.; Wu, Y.W.B. Conceptualization and measurement of assistive technology usability. *Disabil. Rehabil. Assist. Technol.* **2007**, *2*, 235–248.

39. Svendsen, E. *"Tal her" Formidling av Avanserte Kommunikasjonshjelpemidler og Betjeningssystemer* [in Norwegian]; NAV Hjelpemiddelsentral Sør-Trøndelag: Trondheim, Norway, 2010.

40. Ravneberg, B. Identity politics by design—Users, markets and the public service provision for assistive technology in Norway. *Scand. J. Disabil. Res.* **2009**, *11*, 97–110.

41. Hocking, C. Having and using objects in the western world. *J. Occup. Sci.* **2000**, *7*, 148–157.
42. Ravneberg, B. De Rette Tekniske Hjelpemidlene. In *Funksjonshemming: Politikk, Arbeidsliv og Hverdagsliv* [in Norwegian]; Tøssebro, J., Ed.; Universitetsforlaget: Oslo, Norway, 2010; pp. 197–212.
43. Skär, L. Peer and adult relationships of adolescents with disabilities. *J. Adolesc.* **2003**, *26*, 635–649.
44. Kent, B.; Smith, S. They only see it when the sun shines in my ears: Exploring perceptions of adolescent hearing aid users. *J. Deaf Stud. Deaf Educ.* **2006**, *11*, 461–476.
45. Watson, N. Well, I know this is going to sound very strange to you, but I don't see myself as a disabled person: Identity and disability. *Disabil. Soc.* **2002**, *17*, 509–527.
46. Dobransky, K.; Hargittai, E. The disability divide in Internet access and use. *Inf. Commun. Soc.* **2006**, *9*, 313–334.
47. Emiliani, P.L. Assistive technology (AT) versus mainstream technology (MST): The research perspective. *Technol. Disabil.* **2006**, *18*, 19–29.