Disabilities and ICTs - Is digital inclusion possible?

A qualitative interview study about internet skills and how people with disabilities are adopting them in the context of today's ever changing technological landscape

Alessa Lüggert – s2029049

Bachelor Thesis in Communication Science (BSc)

Faculty of Behavioural, Management and Social Sciences (BMS)

Supervisor: Dr. Alex van der Zeeuw

University of Twente

11.04.2023

Abstract

The inclusion of people with disabilities and the support they receive from society is nowadays better than ever. However, there is still an evident lack when it comes to their online presence and, therefore their level of skills obtained to operate and navigate successfully on the internet. This lack of skills is argued to be the caused because of a lack of cognitive abilities to even obtain the needed internet skills. Therefore, this study focused on filling the gap in the literature by focusing on the people with the main experienced impairments namely a visual, hearing, or mobility disability by having a semi-structured interview study conducted consisting of 18 respondents in total with a questionnaire based on the pre-existing Internet skill scale (ISS). The purpose was to be able to answer the research question *"How can individuals help a vulnerable group (people with disabilities) in adopting the necessary internet skills needed nowadays?"* in the end. The outcome of the interview study indicates the real problem is directly located at the design of the website-designers and -providers themselves and not the lack of cognitive abilities of the people with disabilities. This is the case as the design of most websites are hardly or non-accessible at all for people with disabilities due to, for instance, their general poor labelling and design of buttons. Overall, the study contributed to a new understanding of people with disabilities and their way of operating, navigating, and communicating on the internet. Additionally, it helped projecting the general proposed problem from a different angle namely, to show that the stereotypical beliefs related to people with disabilities generally needs to be thought over again and different approaches are necessary to not conclude too early.

Introduction

The development of faster information processing and rapidly changing information and communication technologies (ICT) are influencing our day-to-day life dramatically by influencing the way we communicate and navigate through the internet. Moreover, these changing ICTs are the reason why we are currently standing at a breaking point in which it becomes apparent that internet skills are necessary and crucial to be efficiently adopted to be able to be part of contemporary society. This is especially the case when looking at the Covid-19 pandemic as ICTs and, therefore, internet skills became more relevant in today's context so that people can still communicate and collaborate with their peers (Olaniyi, 2022). Additionally, not only social interactions via social media platforms but also work-related tasks are being automated more and more and, therefore, the need for human-machine integration is not avoidable (Karacay, 2017).

However, these necessary internet skills are not achievable for everyone equally and, therefore, undeniably create a digital divide between people with and without a disability (Sachdeva et al. 2015). This is, for instance, evident when looking at the people in our society who experience a disability or in general are affected by an impairment as it became apparent that these people encounter challenges and barriers when confronted with the internet and the corresponding internet skills to operate it (Oliver, 1996; Allen, 2004; Lazar & Stein, 2017). Next to this, these challenges are not restricted to only one disability specifically but is it is argued that people with a disability generally struggle more with the technological access in their media usage (Bosse & Hasebrink, 2016). Consequently, it is argued that it is important to achieve an understanding of the way how people with disabilities learn these required internet skills and what is restricting them from adopting and implementing these internet skills.

Furthermore, according to the American Library Association (ALA), internet skills can be defined as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (Digital Literacy, n.d.). Moreover, internet skills are often considered crucial and can be distinguished into four main fields. These four fields are related to operational skills, information navigation skills, communication/social skills, and content creation skills (van Deursen et al., 2017).

However, there is only little research available on how to include at-risk groups in this adaptation process nor is there literature about possible strategies of how people with an without a disability would be able to support each other in this adaptation process. Therefore, this study could fill a gap in the existing literature about the possibilities of how different kinds of people can work and support each other in the overall adaptation process that society is currently going through; based on the continuously changing technological environment and, consequently, the ever-changing internet skill requirements for the society.

Furthermore, this research aims to provide in-depth information about the internet skills and how people with disabilities use and include them among their Internet activities. Therefore, the research question in this paper addressed is as follows: *"How can individuals help a vulnerable group (people with disabilities) in adopting the necessary internet skills needed nowadays?"*. This research will, therefore, also take into consideration so-called at-risk groups which might be left behind in this adaptation process of these internet skills and propose strategies that could help people coming from the at-risk groups in the adaptation process, therefore, to work on a digital inclusion that considers and include everyone equally.

Theoretical background

Internet skills

Internet skills are a necessity to be able to operate not only on the internet in work-related terms but especially also to use it for social interactions. Moreover, Van Deursen et al. (2016) have identified four types of skills namely operational skills, information-navigation skills, social skills, and creative skills. Operational skills entail basic technical skills which can be seen as a pre-requirement to even be able to use the Internet. Next to this, information-navigation skills are based on the ability to find, select, and evaluate information on the internet while searching for them. Additionally, as argued by Van Deursen et al. (2016) these mentioned skills (operational and information-navigation skills) are normally needed for Web 1.0 activities, but they represent the baseline for the skills needed to engage in Web 2.0 activities.

Furthermore, the skills referring to Web 1.0 activities and, therefore, operational and navigation skills can be related to reading and consuming online content (Cormode & Krishnamurthy, 2008). On the other side, Web 2.0 activities are, for instance, social skills. Social skills entail the ability to use communication and interactions in an online environment to understand, create, and exchange meaning or knowledge. These skills

rely on aspects of searching, evaluating, and acting on online contacts which then results, for instance, in the ability to profile, attract attention online, and to participate in a knowledge exchange by which meaning is created (van Deursen et al., 2016). Moreover, as it is evident that these skills are connected with each other it is also important to understand how people with disabilities use this as there is only little literature available on this. However, what is known is that people with disabilities are lacking a general access towards technological devices (Mcdonald & Clayton, 2013) and it is also said that people with disabilities are less likely to spend time online compared to the general public (Bosse & Hasebrink, 2016). Consequently, it is important to receive a greater understanding of how people with disabilities are using the internet. Additionally, it is important to investigate whether people with disabilities spend less time on the internet because of access challenges or whether this is restricted to the level of internet skills they posess and therefore which needs to receive greater attention.

Internet use among people with disabilities

As there are four types of skills needed to use the Internet appropriately, and as indicated it seems there is a difference between how people use technology without disabilities compared to people with disabilities Therefore, to be able to understand the internet behaviour of people with disabilities better, and how they develop internet skills, it is necessary to understand the nature of people with disabilities and how they make use of ICTs. For example, in recent years researchers found out that people with disabilities are not always benefitting from the use of ICTs, and consequently their internet usage, due to no utilization of the digital era opportunities. But instead, these new technological devices and opportunities that are arising with them are creating an ever-increasing digital divide (Gogging, 2007; Harris, 2010; Oliver et al., 2001).

To be more specific, new digital technologies or ICTs are not creating a form of inclusion for such people with impairments but rather create more barriers that exclude such people due to many factors. These factors are based on, for example, the lack of support or lack of skills required to access the needed resources (Allen, 2004; Lazar & Stein, 2017; Oliver 1996). Additionally, researchers further state that developers of new online software mostly do not consider people with disabilities during the design process (Ellis & Kent, 2011; Lazar & Stein, 2017). Next to this, it is further noticeable that new social inequalities for people with

disabilities are occurring. This is due to the rapid development of ever new evolving technological devices and aspects such as the continuous updating of requirements to use such devices and to navigate through the internet, the non-accessible design, and poor training from developers or providers (Jaeger, 2006; Harris 2010; Mcdonald & Clayton, 2013; Areheart & Stein, 2014). Consequently, it could be argued that this could be an indication that the digital divide and therefore the gap that is existent between how people use ICTs compared to people with disabilities is not only increasing due to the occurrence of these problems but that people who experience a disability, or an impairment to some degree, are being left behind.

However, as opposed to the tendency mentioned above and when looking from the compensation model perspective ICTs and digital media, in general, can propose an opportunity for people with disabilities. This is the case, as the compensation model indicates that people with disabilities or any kind of impairments are generally more isolated and have lower levels of social interactions compared to people without disabilities which can be compensated through online communication tools (Bowker & Tuffin, 2002) such as social media platforms. Additionally, through this perspective people with disabilities can use ICTs to overcome the limitations their body is causing them and to be able to improve their life chances (Cummings et al., 2002). However, due to new social inequalities which were mentioned above that people with disabilities are faced with, the benefits people with disabilities could gain from using ICTs such as overcoming the limitations caused by their disability gets arguably less attention. Consequently, it is necessary to gain a better understanding of this group of people in terms of how they interact and which skills they have already accomplished and adopted to be able to adequately support them in it.

Digital inequalities and people with disabilities

People with disabilities face many challenges which cause further social inequalities and also an increase in the digital divide gap between people with and without a disability. This is the case as people with disabilities are often limited in their access to technological devices thus, leading to a greater problem namely that these people also often lack the opportunity to develop required internet skills (Scheerder et al., 2017). Therefore, it is necessary to understand the underlying needs and challenges that people with disabilities are faced with when they need to operate or navigate the internet so that they are able, for example, to communicate and interact with other people. Moreover, for people with disabilities, internet skills can offer a

lot of benefits as it was identified above. This is the case as for mobility-impaired people the Internet can be a place which offers them the possibility to take part in or perform activities which would be unavailable for them in the offline world. Additionally, it is further argued that for instance people with visual or hearing impairment can benefit from ICTs in the form that they offer a way to overcome their sensory deficiencies (Lissitsa & Madar, 2018). However, as it became evident due to many factors these mentioned benefits and possible contributions towards the social life of a person experiencing any sort of disability are stagnating. With this, it is meant that because of factors such as insufficient accessibility due to the design of a website (Jaeger, 2006; Harris 2010; Jaeger, 2006; Mcdonald & Clayton, 2013; Areheart & Stein, 2014), it could be argued that people with a disability are not able to adopt and learn all necessary skills related to information-navigation and in some cases maybe it could also harm their ability to adapt communication skills. This is, because of the Web 1.0 activities which are creating the baseline for Web 2.0 which also includes communication skills (van Deursen et al., 2016).

Next to this, it could be further argued that because of the continuous updating of requirements to use current ICTs and, therefore, be able to navigate through the internet (Jaeger, 2006; Harris 2010; Mcdonald & Clayton, 2013; Areheart & Stein, 2014) information-navigation skills as well as operational skills cannot be adopted and implemented adequately in their internet usage because of the ever-changing nature of these requirements. Additionally, this is also already a well-recognized problem, for example, Phillips and Zhao (1993) stated that even minor changes in ICTs can make it impossible for people with impairments to carry out internet-related tasks. Furthermore, also because new technologies nowadays are created with the purpose to be even more interactive (as the creation of social networking platforms indicates) many people with impairments are not benefiting from this new development but instead, they apparently struggle more to adapt to these ICTs (Johnson & Moxon, 1998; Birchmeier et al., 2011). Consequently, it is further argued that these people are less likely to take part in socializing online activities such as communicating with other people but are more likely to use the Internet for playing games or searching for information related, for instance, to their health.

Overall, and with everything said it is undeniably important to gain a deeper understanding of the support that people with disabilities need in order to efficiently adopt and implement the needed internet skills for a contribution to society and to understand their way of interacting with the Internet and on the Internet.

Method

Research Design

The approach chosen for conducting this study, therefore, to be able to answer the proposed research question, was qualitative. As opposed to quantitative research, qualitative research offers the researcher to achieve a deeper understanding and insights into a particular topic instead of gathering numeric data. Additionally, also due to the nature of the research question it is believed that the qualitative approach is the best fitting (Creswell et al., 2011). Next to this, in the context of this research it was argued that the insights and personal experiences of the vulnerable group are of higher value for proposing an answer to the research question compared to gathering numeric data. Moreover, when following the qualitative approach, it is meant that the researcher used the method of interviews. Through the use of interviews, the researcher aimed at exploring the experiences and views of the participants regarding the research topic to draw conclusions and propose recommendations toward the research question. To be more specific, the interviews were of a semi-structured type as through this it was ensured that the participants received some kind of guidance on what to talk about but were still able to report their own experiences on this matter (Chilban, 1996; Rubin & Rubin, 2005). Additionally, the usage of this type of interview further ensured that other aspects were discovered or elaborated on which might have been of importance for the participant but have not been thought of during the process of developing the questions (DiCicco-Bloom & Crabtree, 2006).

Furthermore, the semi-structured interviews have been divided into questions related to operational internet skills, information navigation skills, and communication/social skills that the participants have (see appendix A). Additionally, question asked about operational skills were for example, "*What were your experiences when opening a browser on your technological device?*", for information-navigation skills question such as *"What are your experiences with using keywords for online searches?"* were asked as well as for the communication internet skills questions such as as "What are your experiences with commenting or posting things online?" were used (see appendix A). Next to this, one question has been repeated after each category which should help to deepen the understanding of the participants' needs in terms of additional support. This means to get a better understanding of what kind of support, people with a visual, mobility, or hearing disability believe would be required to be able to adapt to the needed internet skills (see appendix A).

Additionally, it is further argued that through this additional question it is possible to receive a better understanding of their way of learning and sense-making while being on the Internet. Furthermore, there were a total of 18 interviews conducted from which 15 people came from one of the vulnerable groups (either with visual, mobility, or hearing impairments) and three people were present as a proxy user and the option was used to also gather data on their experiences in such role. Lastly, the duration of the interviews was approximately 40 minutes, and they were recorded based on a prior established informed consent form in which the participant was informed about the purpose of the interview as well as they could ask questions prior to the interview and to clarify the conditions of participation for the interview.

Participants

In this study, 18 participants have taken part in the interviews. Moreover, the age range of the interviewees was between 20 till 47 years old and all participants were coming from Germany. Next to this, 15 out of 18 of the participants were coming from vulnerable groups that experienced either visual, mobility, or hearing impairments and the other three participants were interviewed as well as they had the role of a proxy user which was believed they could provide additional viewpoints to the research question. Additionally, out of the 15 participants experiencing an impairment either visually, hearing or mobility-wise, 5 participants represented each group accordingly. Furthermore, the sampling procedures followed were of the kind of purposive sampling. This was the case, as to be able to answer the research question at hand the participants needed to be part of the disability community and which is the reason why there is a ratio of 5 participants representing either people with visual, hearing, or mobility impairments to some degree in order to receive a clear picture about their experiences in the prior identified topics, therefore to be able to draw a clear conclusion in the end.

Analysis

Based on following a qualitative approach by using semi-structured interviews the analysis conducted was of type of an abductive analysis in combination with a thematic analysis. Furthermore, abductive analysis was used as an analysis tool due to its believed contribution to the research question as the analysis is aiming at theory construction (Timmermans & Tavory, 2012) . This means that the researcher tried to achieve an in-depth understanding of existing theories (Timmermans & Tavory, 2012) which means in this regard how people with

a disability are accessing and making use of the today's internet and corresponding theories out of these studies. Additionally, after the researcher made herself familiar with existing theories the data which were gathered throughout the interview process were coded by using a thematic analysis. Thematic analysis is an additional tool which can be used in combination with abductive analysis as the thematic analysis aims at identifying patterns in the meaning of the data (Braun & Clarke, 2006). Next to this, this meant that the researcher had transcribed the interviews of the 18 participants in order to get familiar with the data, then to search for unexpected findings or anomalies which are either contradicting or verify existing theories in this field. Moreover, the software used for coding and analysing the data was Atlas.ti. Furthermore, the researcher categorized the data based on the overall topics discussed during the interview namely skills referring to operational, information navigation, and communication skills. Lastly, through the combinational use of abductive and thematic analysis, it was believed to receive a clearer overview of each aspect of the three different interview sections, so that it was possible to report for every topic what we knew based on existing literature and what is new to our knowledge so far and, therefore, to be able to adequately identify the answer to the research question in the end.

Results

Operational skills

No participant nor group showed major issues or reported major problems while being asked about their experiences with operational skills. However, obstacles are still found with the visual and mobility impaired participants and even the proxy users. This is the case as some of the participants who experience visual impairments to some degree stated that they only encounter problems when they needed to adjust privacy settings on websites or also referred to as websites cookies. Participant 4 who is visually impaired and 34 years old, mentioned that:

> *Oh yeah, but this is only happening on websites, as again I can't use my program here to support me you know, or at least in most cases to support me as I they are not labelling the button correctly because either they forgot or, how could you say it, ah, they are just not caring for people like me and that makes it difficult for me to use the website how I would like to or the extent.*

Additionally, participant 5 who also struggles with a visual impairment, is 41 years old, referred to this by saying:

> So I believe what I want to say with it, is that not all websites but a lot of them are not designed for people like me or they just seem not to care and it seems like they want to make it even more difficult for people like me to use their services.

Struggling with the design of the website indicates that people who are experiencing visual impairments feel a lack of care and recognition for their needs in the design process of specific websites by the general providers and designers which consequently makes it difficult for the visual impaired people to operate on the internet. Similarly, operational barriers not by the users but in the design of digital technologies, the participants who experience mobility impairments mentioned challenges in terms of using shortcuts. This is due to the fact, that according to participant 16 who is 29 years old, and is mobility impaired they need to use assistive technology in form of, for example, a special keyboard or an electrical computer mouse included in their wheelchair:

> so you see it is not really possible for me to use these shortcuts as it is just not possible for me because I just can't do it, I mean I ah know of some shortcuts but it is not possible because my my mouse is not having this option.

Therefore, for people with a mobility impairment it can be said that there is an evident lack experienced by those people between the requirements that assistive technology should fulfil and what they are currently capable of so that people who are dependent on this technology can take part in online activities of any kind and are not restricted to the degree to that they can access and make use of the Internet. Furthermore, proxy users stated that they would feel as there is lack of support from the company, they are working for in order to be familiarised with the technology their clients use so that they are able to support their clients most effectively and efficiently.

Overall, it can be concluded that people coming from either one of the target groups namely, having a visual, hearing, or mobility impairment are not lacking the cognitive skills to operate efficiently and effectively on the internet but that the non-accessibility of websites and the restrictions that current assistive technologies still hold are the bigger problems in this regard. Lastly, the lacking factor of care in the design process which is

resulting in the non-accessibility of websites could be also an indication for an even bigger problem lying directly at the provider and designers end as it also shows a lack of support from their side towards people with disabilities.

Information navigation skills

During the analysis for this section, it became apparent that in all three target groups (visual, hearing, or mobility impaired people) problems have occurred which restrict them to properly use the internet as it currently is constructed. For instance, participants with visual impairments stated that even though they know how to navigate the internet properly by knowing how to use keywords for online searches or validate information retrieved online, backlashes occur when being confronted with wrong labelling of buttons in website. This goes beyond the scope of the operational skills as such barriers in todays technology has an effect on how well these people can navigate the internet. This is the case as for instance when navigating through websites buttons which we all know such as the "menu" button or being "forwarded" button are not properly labelled during the design process which makes it impossible for people experiencing this kind of disability to navigate and make use of Internet as they want to. For example, participant 1 who lost the ability to see around seven years ago said:

> *Yeah and this is just frustrating for me as ah I don't know I believe no one likes to feel excluded but this, this is exactly the case when, for example, you cannot use the use the website because it is not properly labelled and simply they just haven't thought about people like me.*

Therefore, people experiencing visual impairments have the feeling of exclusion in terms of using a website through information navigation as there is again evidence for the feeling of lack of care from the side of the designers and providers of these websites.

Furthermore, participants with mobility impairments found issues of unawareness of using specific keywords or functions when navigating through the internet and people experiencing hearing impairments mentioned major challenges due to the design of some website. For instance, participant 10 who has a hearing impairment and is 22 years old stated:

> *Yeah, do you know when there are like, some, a, floating videos, I believe you can name them like it?*
>
> *... it makes it not possible for me to close them due to the tiny button which is normally embedded*

in the video itself and when I'm in public I have panic when reading an article that I have my sound

too loud and because I cannot hear it properly I am looked at very angrily when being outside and a

bigger crowd is surrounding me.

Consequently, such challenges that people with hearing impairments experience namely, for instance, being confronted with these pop-up videos in public is creating a negative impact on the social context of these people. This is due to the constant feeling of fear and social pressure to not disturb the people around you, especially when being in public or encountering a bigger crowd. Overall, the cognitive abilities needed to navigate the internet are not an issue but that a combination of the problems already encountered and discovered with operational skills, such as poorly labelling of buttons on the websites, are even more evidently present when navigating the internet. Additionally, it is also important to mention that besides problems that occur due to the lack of possible support in the first section of operational skills also the social factor and feeling of embarrassment plays a big role when navigating ICTs in public.

Communication skills

People with visual impairments experienced major issues which can be related to their communication skills but are originating in the lack of navigation possibilities on the internet. However, because of the lack of navigation skills but not on a cognitive level from the interviewees but more the lack of a proper design of websites their communication skills are also affected. This can be seen, for example, as participant 3 who is 20 years old and experience a visual impairment stated:

So I don't have issues with this you see, but I have, a problem with the navigation, as, these platforms

are more or less ah, the only option for me to communicate with my friends, but I ah, can't make use

of it to the most potential present as buttons are not communicated in the right way.

Additionally, participant 2 also coming from the visual impaired target group and who is 26 years old mentioned:

Yeah and wrong labels of the buttons, propose, a higher risk to people like me, because we rely on

those label to like communicate on for example WhatsApp with our friends…

With this, it can be stated that today's ICTs are evidently sometimes the only possibility for people with disabilities and in the context of people experiencing visual impairments to communicate and socialize with

friends. However, this is not always possible to the extent that these people want to make use of it which is due to the lack of required navigational skills on the internet because of, for instance, a poor design of the website, which consequently could affect the communication skills and aspects of the social life of the people who are experiencing this impairment.

Furthermore, it became evident throughout the interviews that all three groups are mainly using the internet and, therefore, social media platforms to communicate or to "to keep in touch" with their social surrounding. However, only the hearing-impaired participants added that those social media platforms are used by them because they offer them a wider pool of possible connections as when writing the message, no miscommunication can take place as the other person they are talking to do not need to know, for example, the sign-language. This can be seen, for example, in the interview with participant 8, coming from the group of people who experiencing a hearing impairment as it was reported:

Oh yeah, I really like using Facebook and ah the messenger for example, as I can freely express my, my opinions without the other person knowing that I'm almost deaf.

Consequently, people experiencing hearing impairments see social media platforms as a bridge to communicate with people coming from other social groups which they normally would not be able to communicate with due to the language/sign-language barrier. Overall, three things can be concluded from the data. The first thing concerns the cognitive ability of participants to understand and be able to know what the skills require and are used for. Throughout the interviews it became apparent that all participants had the cognitive ability to understand what the asked skills referring to and what you should be able to do when being confronted with these skills and it did not matter in which target group, they were present in. Furthermore, the second factor which stood out is that almost all participant had mentioned the poor design of websites which is evidently a major issue for people with disabilities of any kind as this can affect not only their navigation skills but again it is arguable that this barrier is holding them back from being able to achieve the required communication skills and, therefore, to make full use of the internet.

Lastly, another major point that seemingly affects people with disabilities in their adaptation of the internet skills is a combination of the limitation of the assistive technology and the poorly designed websites by designers and providers. This is the case as the data showed that sometimes also the assistive

technology used by the participant reached it limitation in the form that it was useless for a specific website which was then again a consequence of the poor labelling of buttons and of the website in general. Therefore, it can be concluded that the data showed that the problem of the adaptation process not necessarily is being delayed for people with disabilities because of their cognitive abilities to understand these internet skills.

Discussion

As indicated in the beginning of this paper the aim of this research was to identify challenges that vulnerable groups face regarding currently needed internet skills in today's time and how an individual can support these people better, so that they are effectively and adequately included in our society. However, a clear answer cannot be drawn as it seems that based on the input of the particpants, there is no big lack of internet skills, but the problem seems to be externally. With this it is meant that the participants does not lack the ability to understand these internet skills but that the bigger issue lies in the design of the website and the accessability of them. Moreover, this became clear as for neither required skills set of either information navigation, communication, or operational skills not one of the 15 interviewees out of the 18 belonging to one of the target groups (person experiencing either auditorial, visual, or mobility impairment) in this study reported major problems when it came to questions related to their cognitive skills of the respective internet skills part by for example, knowing when and when not to share information online and or to be able to use shortcuts or to be even aware of it. Consequently, it is believed that through this research a better understanding was achieved about how people of vulnerable groups interact within the internet and use their digital skills for that. Next to this, it further indicates that there is no need to intensify the support provided to such people regarding their cognitive abilities however, the problem seems to be bigger. With this it is meant, that assumingly there needs to be a drastic change in how websites are being designed in order to make them accessible and inclusive of people coming from vulnerable groups such as the representatives in this research.

Furthermore, the data of the interviewees build on existing evidence of the digital divide which is happening for people with disabilities or impairments by the ever-new evolving and developing technological landscape (Gogging, 2007; Harris, 2010; Oliver et al., 2001). Additionally, this is further in line with what was reported by the participants as they have no guaranteed access to all websites that they would like to make use

of, whether it is with regard to social media platforms or news websites. Furthermore, the results confirmed the findings of (Oliver, 1996; Allen, 2004; Lazar & Stein, 2017) as the participants also stated that they feel a lack of support and inclusion towards this topic. However, it became evident that the participants are not necessarily lacking the internet skill perse which is then again in contrast to what existing literature had argued about (Oliver 1996; Allen, 2004; Lazar & Stein, 2017). This leads to the speculation that there is no cognitive lack present by people coming from these vulnerable groups but the realisation of proper accessibility. Additionally, this is in line with the argument that people with disabilities or impairments are in most cases not considered during the design process of such devices or platforms (Ellis & Kent, 2011; Lazar & Stein, 2017)

Moreover, as discussed by Cummings et al. (2002) it was claimed that people with disabilities or impairments could benefit from the use of ICTs as they could overcome limitations present in their offline life. This was also confirmed by the participants as some reported that they feel more included in the online world as for example, people with hearing impairments could still communicate with a broader spectrum of people as in the online environment there is no need to be able to talk and know how to use the sign language. However, this is restricted in terms of that this is only possible if the accessibility of the website is provided. For example, one participant of the hearing impairment group reported this statement but in contrast to this, participants from the visual impaired group reported difficulties due to accessibility. Therefore, it can be argued they feel like being overlooked at on such opportunities   Furthermore, it is believed that the data contributes to a clearer understanding of the actual challenges of people coming from a vulnerable group to the extent that it is now known that the support needed by those people needs to be focused not on them or their ability to cognitively understand current internet skills but more to shift the focus on the outside factors which make it able for these people to be fully included to the full capacity the online environment is offering to people nowadays.

Lastly, it also needs to be acknowledged that due to the use of a specific group of people, namely those coming from vulnerable groups and experiencing either hearing, visual or mobility impairments the generalizability can be argued to be limited. This is the case as the sample size of 15 participants coming from these vulnerable groups and three additional participants operating as proxy user for some of the participants who were present were relatively small. However, due to rich and new insights provided through this study

there is still the possibility to generalize the findings to the research scope of people experiencing any disabilities.

Conclusion

The aim of this research was to receive more in-depth information about how people coming from vulnerable groups use the internet and to what extent they have the identified crucial internet skills for operating on the internet. Therefore, the central question of this research was as follows: *"How can individuals help a vulnerable group (people with disabilities) in adopting the necessary internet skills needed nowadays?"*. Moreover, based on the qualitative analysis approach of this research and the resulting interviews of the participants, it can be concluded that current people coming from vulnerable groups do not need essential support to understand the needed internet skills on a cognitive level but that it needs to concentrate on the support provided directly by the developmental phase of such new technological devices or providers. This is the case as identified above most participants did not have inabilities of the understanding of what each internet skill category implies but the accessibility of those website due to the lack of, for example, properly labelled buttons on website or generally irritable website designs. Overall, this research contributes to the existing literature as it was proven that people coming from a vulnerable group do not lack the cognitive ability and, therefore, understanding of needed internet skills as it was proposed in the beginning of this paper but that it is in some cases just not possible for them to make use of internet skills due to inaccessibility and lack of proper implications of the technology itself while considering people with disabilities as well.

Limitations and Recommendations

Based on this conducted study and the given conclusion above it needs to be acknowledged that the study also had limitations. With this it is meant and as indicated in the discussion that because of the nature of the study it could be argued that semi-structured interviews were not the best choice. This is because people tend to only express their best sides during an interview. Therefore, it could be argued that the results cannot provide a clear picture of the participants actual level of internet skills. However, this could be tackled in future research by conducting an additional study in which the questionnaire in combination with a user-test is being used to have an adequate image of the actual level of internet skills of people with either visual, hearing, or mobility impairments while still taking their personal experiences into account. Moreover, additional research is, therefore,

needed in this field to determine the effects of possible consideration of people coming from vulnerable groups when being included in the design process of future technological developments. This should ensure that our society is able to properly include those people into the societal context to its most potential. Lastly, through this research it is possible to broaden the understanding of people who are often left out in the design process of newly evolving technologies and the impact it has on them.

References

Allen, C. (2004). Bourdieu's Habitus, Social Class and the Spatial Worlds of Visually Impaired Children. *Urban Studies*, *41*(3), 487–506. https://doi.org/10.1080/0042098042000178654

Areheart, B. A., & Stein, M. A. (2014). Integrating the Internet . 83 George Washington Law Review 449 (2015), University of Tennessee Legal Studies Research Paper No. 231. Retrieved from https://ssrn.com/abstract=2420510

Birchmeier, Z., Dietz-Uhler, B., & Stasser, G. (2011). *Strategic Uses of Social Technology: An Interactive Perspective of Social Psychology*. Cambridge University Press.

Bosse, I., & Hasebrink, U. (2016). *Mediennutzung von menschen mit behinderungen*. Medienanstalten. https://www.die-medienanstalten.de/fileadmin/user_upload/die_medienanstalten/Publikationen/Weitere_Veroeffentlichungen/Studie-Mediennutzung_Menschen_mit_Behinderungen_Langfassung.pdf

Bowker, N., & Tuffin, K. (2002). Disability Discourses for Online Identities. *Disability & Society*, *17*(3), 327–344. https://doi.org/10.1080/09687590220139883

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Chilban, J. (1996). Interviewing in Depth: the Interactive Relational Approach. Thousand Oaks, California: Sage.

Cormode, G., & Krishnamurthy, B. (2008). Key differences between Web 1.0 and Web 2.0. *First Monday*, *13*(6). https://doi.org/10.5210/fm.v13i6.2125

Creswell, J. W., Klassen, A. C., Clark, V. L. P., & Smith, K. (2011). Best Practices for Mixed Methods Research in Health Sciences. *PsycEXTRA Dataset*. https://doi.org/10.1037/e566732013-001

Cummings, J. N., Sproull, L., & Kiesler, S. (2002). Beyond hearing: Where the real-world and online support meet. *Group Dynamics: Theory, Research, and Practice*, *6*(1), 78–88. https://doi.org/10.1037/1089-2699.6.1.78

DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education*, *40*(4), 314–321. https://doi.org/10.1111/j.1365-2929.2006.02418.x

Digital Literacy (n.d.). *Welcome to ALA's Literacy Clearinghouse*. ALA Literacy Clearinghouse. Retrieved from
https://literacy.ala.org/digital-literacy/

Ellis, K., & Kent, M. (2011). *Disability and New Media*. Routledge.

Goggin, G., & Newell, C. (2007). The Business of Digital Disability. *The Information Society*, *23*(3), 159–168.
https://doi.org/10.1080/01972240701323572

Harris, J. R. (2010). The use, role and application of advanced technology in the lives of disabled people in the
UK. *Disability & Society*, *25*(4), 427–439. https://doi.org/10.1080/09687591003755815

Jaeger, P. T. (2006). Assessing Section 508 compliance on federal e-government Web sites: A multi-method,
user-centered evaluation of accessibility for persons with disabilities. *Government Information
Quarterly*, *23*(2), 169–190. https://doi.org/10.1016/j.giq.2006.03.002

Johnson, L. M., & Moxon, E. (1998). In Whose Service? Technology, Care and Disabled People: The case for a
disability politics perspective. *Disability & Society*, *13*(2), 241–258.
https://doi.org/10.1080/09687599826812

Karacay, G. (2017). Talent development for industry 4.0. *Springer Series in Advanced Manufacturing*, 123–136.
https://doi.org/10.1007/978-3-319-57870-5_7

Lazar, J., & Stein, M. A. (2017). *Disability, Human Rights, and Information Technology*. University of
Pennsylvania Press.

Lissitsa, S., & Madar, G. (2018). Do disabilities impede the use of information and communication technologies?
Findings of a repeated cross-sectional study – 2003–2015. *Israel Journal of Health Policy Research*, *7*(1).
https://doi.org/10.1186/s13584-018-0260-x

Macdonald, S. P. J., & Clayton, J. (2013). Back to the future, disability and the digital divide. *Disability &
Society*, *28*(5), 702–718. https://doi.org/10.1080/09687599.2012.732538

Olayini, O. (2022). Digital skill and future of business education students. *Educational Research (IJMCER)*, *4*(1),
186-192. Retrieved from https://www.ijmcer.com/wp-content/uploads/2022/01/IJMCER_W0410186192.pdf

Oliver, M. (1996). *Understanding Disability: From Theory to Practice*. Bloomsbury Publishing.

Oliver, M., C. Barnes, and C. Thomas. 2001. Disability and the sociological imagination. Sheffield: Teaching and Learning Network

Phillips, B., & Zhao, H. (1993). Predictors of Assistive Technology Abandonment. *Assistive Technology*, *5*(1), 36–45. https://doi.org/10.1080/10400435.1993.10132205

Rubin, H. J., & Rubin, I. (2005). *Qualitative Interviewing: The Art of Hearing Data*. SAGE.

Sachdeva, N., Tuikka, A., Kimppa, K. K., & Suomi, R. (2015). Digital disability divide in information society. *Journal of Information, Communication and Ethics in Society*, *13*(3/4), 283–298. https://doi.org/10.1108/jices-10-2014-0050

Scheerder, A. J., Van Deursen, A. J. a. M., & Van Dijk, J. A. (2017). Determinants of Internet skills, uses and outcomes. A systematic review of the second- and third-level digital divide. *Telematics and Informatics*, *34*(8), 1607–1624. https://doi.org/10.1016/j.tele.2017.07.007

Timmermans, S., & Tavory, I. (2012). *Theory Construction in Qualitative Research. Sociological Theory,* *30*(3), 167–186. doi:10.1177/0735275112457914

Van Deursen, A. J. a. M., Helsper, E., & Eynon, R. (2016). Development and validation of the Internet Skills Scale (ISS). *Information, Communication & Society*, *19*(6), 804–823. https://doi.org/10.1080/1369118x.2015.1078834

Van Deursen, A. J. a. M., Helsper, E., Eynon, R., & van Dijk, J. A. (2017). *The compoundness and sequentiality of digital inequality.* International Journal of Communication, 11. pp. 452-473. ISSN 1932-8036

Appendix

Appendix A

Interview Questionnaire

Operational Internet skills

Based on your experience, how would you describe your ability to operate on the internet?

- Have you experienced any difficulties when downloading, for instance, a file or photo from an internet source?

  o Please elaborate (more) on it

- What were your experiences with using so-called shortcut keys when operating on the computer?

  o What were your experiences with such shortcut keys when operating on the Internet?

    ▪ Do you use the shortcut, for instance, on a website for finding a specific word?

- What were your experiences when opening a browser on your technological device?

  o Have you experienced any differences between different browsers, for instance, when using Chrome instead of Firefox? (Depending on whether the participant used a different kind of browser)

- What were your experiences when connecting to the Wifi?

  o Have you faced any difficulties while you try to connect to the Wifi, please state them?

    ▪ How have you handled such a situation?

- What are your experiences concerning privacy settings, have you faced any difficulties when you, for instance, need to adjust them?

Based on our conversation and the multiple aspects that you have elaborated on, especially the parts which were challenging for you (name the challenges mentioned throughout this section) what kind of support do you wish to receive in order to adapt to these skills?

Information Navigation skills

What are your experiences with finding information online?

- What are your experiences with using keywords for online searches?

        o   What challenges have you encountered while searching for information in such a way?

- What are your experiences with revisiting a website?

        o   What was challenging/easy and why?

- How do you check the validity and reliability of information retrieved online?

        o   What were your experiences, and what was challenging/easy?

Based on our conversation and the multiple aspects that you have elaborated on, especially the parts which were challenging for you (name the challenges mentioned throughout this section) what kind of support do you wish to receive in order to adapt to these skills?

Communicational Internet Skills

How would you describe your behavior when communicating online?

- What information do you normally share on the internet?

        o   Have you experienced situations in which you may have shared information that was inappropriate?

        o   Do you think, you know when you should and should not share information online?

- How are you ensuring to act appropriately in a situation which happens in an online environment?

- What are your experiences with commenting or posting things online?

        o   Do you know how to communicate yourself through writing a post or comment online?

- How do you decide which information is appropriate to share on the internet and which is not?

- How do you experience the usage of emoticons?

Based on our conversation and the multiple aspects that you have elaborated on, especially the parts which were challenging for you (name the challenges mentioned throughout this section) what kind of support do you wish to receive in order to adapt to these skills?