Mediating Technologies in Standardized Normalities:

Stories from Education of Blind and Visually Impaired Children A Techno-Anthropological study of Technology, Perception, Inclusive Education and Standardization in a Majority's World



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Abstract

This study aims to explore technological mediation and individual perception. Based on ethnographic fieldwork at an event for blind and visually impaired children, along with interviews with various educators of these children, I approach stories of technologies used for literacy practices in different educational settings, and how technologies take on different roles depending on culturally defined normalities within these settings. Further, I discuss how technologies more broadly mediate human practices towards standardization. This is debated in relation to the movement towards "inclusive education" in Denmark, and abroad; along with the world that I suggest is standardized towards the majority of people. I debate what I regard as beneficial within inclusive education, design of technologies in regard to minority groups, and how individual perception and technological mediation is essential when conducting research of human practices.

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Structure of a Problem Based Master Thesis

This Master Thesis is written from the approach taught at Aalborg University, where we work from Problem Based Learning (AAU n.d.). The projects we are trained in writing are *problem based* meaning there is a *focus* on a problem or phenomenon that needs to be described, understood or handled. This is different from *subject* based projects, where the researcher unfolds a subject of interest; within theories, historical development or showcasing skills of deep knowledge of a particular subject. (Pedersen 2003) Rather, I approach phenomena interdisciplinary within different knowledge fields, through a Techno-Anthropological approach described in section 2.4. Thus, the writing increases from descriptive to analytical and towards broader implications, with the following structure:

2. Problem Analysis consists of, mainly descriptive, introductions to key terms and knowledge within different fields, used in this study. Further, I clarify my approach to practices, knowledge and technologies in relation to these fields.

3. Framing and Problem Statement is narrowing the field, resulting in a clear definition of the phenomena I am exploring in this thesis.

4. Methods are introduced together with the informants of this study. I describe how I have approached data creation using ethnographic methods, and discuss ethical considerations, practical challenges and how I have handled the data.

5. Theory is introduced, in order to frame the epistemological and ontological approach in this study within phenomenological philosophies of technology, combined with terminology from post-phenomenology.

6. Analysis is based in the data from fieldwork and interviews. This data is framed in relation to two different settings, described through phenomenological terminology and related to relevant arguments from various fields. Each subchapter ends in summarized preliminary conclusions.

7. Discussion and Perspectives is a continuation of analysis, however within broader notions of inclusive education in relation to technologies and relates to arguments made in the analysis.

8. Conclusion

<u>1. Introduction</u>

This Techno-Anthropological Master Thesis approaches the individuality of human experiences, and how humans are in constant mediating relations with technologies; both digital and non-digital. This is discussed based on interviews with educators of children who are blind or have a visual impairment, and ethnographic fieldwork with these children. With an interdisciplinary approach, where different fields and disciplines are included, I approach various phenomena of educational practices, human perception, and how technologies mediate various normalities and standardizations, in a world that I suggest is made for the majority.

Blind and visually impaired children have non-visual perceptions of the world, and they exemplify clearly how human experiences are unique to each individual. Passionate educators of these children have different practices in different settings and are all trying to teach their students both academic and social skills. With the movements towards *inclusive education* in much of Western Europe, children with various needs and disabilities are placed within mainstream school settings. These settings I suggest are designed, structured and standardized towards large groups of "normal" average children, that fit within this frame. Mainstream schools are settings where literacy practices, norms and interactions are largely shaped by the majority's abilities: walking, hearing, knowing, and seeing. *Inclusion* is a practice left with the educators, and they are trying to create space for individuality within a one-size-fits-all setting.

I will demonstrate how the standardization of educational systems, is not only a reflection of a cultural or national normality, but a reflection of a world that designs for the majority, with few alterations to fit minorities. In Denmark I did fieldwork at a camp for blind and visually impaired children; a place where they play together, knock over furniture and practice literacy through experiences with their visually impaired or blind peers. At special schools for blind and visually impaired children in the UK and Germany, educators describe how they have time, materials and infrastructure to design their literacy teaching for individual needs and preferences of each visually impaired child. The camp and the special schools can be described as 'isolated' or 'inclusive', 'normal' or 'abnormal', 'excluded' or 'exclusive'. This depends on how one defines these terms, and where one is situated.

In this study I wish to challenge some terms and argue that real-world phenomena are rarely 'good' or 'bad'; and neither can they be described using terms that are not explicitly defined. I

argue that human practices in any setting, are mediated by technologies we use, and technologies in the background. I further suggest that human practices and our definitions of normality and standardizations for the majority, in turn can mediate how individuals experience both technologies, themselves and the world. Experiences are individual, and thus I cannot know how anyone experience. I can simply *interpret* words from educators, and what I myself experience at a camp for children with visual impairments.

2. Problem Analysis: Description of the Field and Terminology

In the following problem analysis, I introduce specific terms used in this thesis. This involves blindness and visual impairment, and the diverse group of children who have this clinically defined disability in common. Following this, I describe the educational settings I approach in this study, and the various titles of educators who teach these children. Further I introduce how I define *literacy* as socio-technical practices and *technologies* within a broad definition of both physical and digital objects. This leads to an introduction to various *literacy technologies* used by the students with visual impairments. Lastly, I describe my own role as a researcher, and my Techno-Anthropological approach, as this has relevance for how this thesis has been written and scoped.

2.1. Blind and Visually Impaired Children and Additional Disabilities

This study approaches technologies used by blind and visually impaired children, so initially I introduce this complex group, and how I distinguish between different terms. Seven million children worldwide have a significant visual impairment (Bourne et al. 2017). This includes children who are categorized as blind or visually impaired (VI). The World Health Organization uses an ICD¹ scale that ranges from mild visual impairment to complete blindness. The degree of impairment is measured in distances, as in how close a VI person needs to be, to see the equivalent of an "average" sighted person. If a person needs to be 6 meters or closer to an object, in order to perceive what an average sighted can see from 60 meters, the person is *clinically* defined as legally blind; written with the fraction 6/60. However due to many types of visual impairments, e.g. tunnel vision, where average vision is limited to a 10 degrees area, not all visual impairments can and will be measured in relation to distance. (WHO 2016) A person with tunnel vision can be *clinically* defined as VI, and be perfectly able to read print text. A person who is defined as *legally blind* might have enough light perception to walk without a cane. Thus, there are multiple definitions which leads me to the complexity of the term 'disabled'. A person can be defined as "disabled" in one situation, however be very able in another. The definition of a "disabled person" is a complex phenomenon. (WHO n.d.a) Because I intend to discuss visual and non-visual perception in this study, I will refer to visual impairment and blindness as *disabilities*, without referring to the complexity of a person being

¹ ICD: International Statistical Classification of Diseases and Related Health Problems

disabled or *abled* in various social and cultural situations. Rather, I refer to children *with* disabilities, such as; the medical definition of a visual impairment. Visual impairment and additional disabilities also correlate, as the majority of blind and VI children have one or more other disabilities, ranging from learning difficulties, mobility issues to severe brain damage (Salleh and Ali 2010). Cortical Visual Impairment (CVI), where the eyes are functional, but the brain cannot process visual information, is also a common cause, being estimated up to 48% of diagnoses amongst children under the age of 15 in the UK. (Rahi and Cable 2003) CVI further links to additional cognitive disabilities in other areas of the brain (Martín et al. 2016). Put simply, children with visual impairments cannot be considered a homogeneous group; both due to their various disabilities and needs, but also because they, like anyone else, have unique personalities and individual experiences of the world.

In this study, I will refer to a *blind* child as an individual with little or no light perception. A VI child I define as someone who has *some* functional vision – that is more than light, in any degree. Together, they will be referred to as 'blind and VI' children, or children who all have a 'visual impairment'. They also categorize more broadly as children *with* disabilities. The reader should keep in mind, that although I write 'blind and VI children', I do not consider them as the same; it is important to note that they are *individuals*. Further, the attributive adjectives of a "VI child" rather than "a child *with* VI" is for simplicity of writing, and not an indication of a "*disabled* child". Thus, when referring to the group, I refer to the *disability* of *visual impairment* they have in common; not the children themselves.

2.2. Educational Settings for Blind and Visually Impaired Children

In the analysis, I approach tree types of educational settings for blind and VI children; *mainstream schools* and *special schools for blind and VI children*, along with a two-day camp for blind and VI children in Denmark. A *setting* in this study, refers to; people, practices, technologies, physical environment, rules, infrastructure etc. within a given geographical space. I discuss these educational settings within a Danish context, and with perspectives from educators within the United Kingdom and Germany, which is further described in chapter 6.

Mainstream schools in this study refers to both private and state funded schools, that follow the national curriculum in the given country they are in. The majority of blind and VI children, with no severe additional disabilities, attend mainstream schools in Denmark, the UK (Chanfreau and Cebulla 2009; Bengtsson, Mateu, and Høst 2010, 93) and Germany according to one informant. Blind or VI children who attend mainstream schools can be in a mainstream class or a special class; the latter for students with various needs and disabilities. In this study, the blind or VI children in both mainstream and special classes are all *within a mainstream school setting*. Blind and VI children in mainstream schools can be taught by a *mainstream teacher*, a *teaching assistant* or a *teacher for the blind and visually impaired*.

- Mainstream teachers refer to qualified teachers who are educated to teach entire classes within a mainstream school setting, in the national curriculum.
- Teaching assistants refer to people that are assigned to support the blind or VI student while also contributing to the entire class. Teaching assistants are not required to have specific qualifications, and their tasks varies from creating accessible teaching materials for the blind or VI student, to supporting the child during separate activities or within class. (Davis 2003, 20)
- A Teacher for the Blind and Visually Impaired; from here referred to as a TVI, can be provided by the local authority or municipality to support children and educators in mainstream schools. TVIs are trained specifically to accommodate various needs of blind and VI children. TVIs provide additional counseling for the mainstream teacher, teaching assistant and parents of the blind or VI child. (Davis 2003, 22) According to informants, TVIs occasionally educate the blind or VI children themselves e.g. in mobility or test of devices. TVIs' visiting hours also vary nationally and are dependent on the situations, needs of the student, and the needs of parents, mainstream teachers and teaching assistants.

Special schools for blind and VI children refer to schools that have blind and VI children, with or without additional disabilities. According to informants from Germany and the UK, these schools most often have students who are blind or VI *and* who have additional complex needs. These schools are often boarding schools and geographically distanced from the student's home. The setting is made to accommodate the needs of blind and VI children, with mostly trained TVIs working there. The classes are smaller, partly due to the differences in the children's abilities, and due to the fewer students in these schools. These schools are few; in the UK there are only around a dozen, and in Denmark there is only one small school. (Den tværministerielle arbejdsgruppe 2011, 14; Synscenter Refsnæs n.d.;"Specialist Schools and

Colleges in the UK" 2014) Since 1898 blind children in Denmark had to attend Refsnæs; a special boarding school for blind children, in order to receive education. After the local government reform in 1970, municipalities could offer special education locally for blind children. Throughout the 70's almost all blind and VI children attended mainstream schools, and Refsnæs changed from being a boarding school to increasingly provide consultancy for municipalities. (Christensen 2011) Today Refsnæs is an educational center where educators, parents and children can attend courses and receive education, while Refsnæs only offer a few school placements for blind children, mostly those with additional complex disabilities. (Synscenter Refsnæs n.d.)

In this study I refer to mainstream school settings, and 'special school' settings. The special schools thus only refer to schools specialized in educating blind and VI children, and *not* other special schools for children with various needs. I refer to TVIs, mainstream teachers and teaching assistants as *educators*. Thus, *educators* as a group can vary in their training, qualifications and specializations, however they are all involved in educating a blind or VI child in practice, in various settings.

2.3. Literacy and Technology for Blind and Visually Impaired Children

I have interviewed educators who work with blind and VI children in both special schools and mainstream schools. This includes TVIs from Germany, the UK and Denmark; some working in special schools and others as visiting support in mainstream schools. Further I have interviewed two Danish mainstream teachers and a Danish teaching assistant. Lastly, I have done ethnographic fieldwork at a two-day camp for blind and VI children in Denmark outside of schools. With this, I intend to define key differences in these educational *settings*, specifically in relation to non-visual perception of blind and VI students. I focus on the roles of what I call *literacy technologies* for blind and VI children, within different settings. It is necessary to define what I mean by *literacy* and *technologies* more broadly, before narrowing the focus to specific literacy technologies in relation to blind and VI children.

Literacy - A Complex Phenomenon

The ability to read, write, understand and interpret stories, is considered important for all educators of blind and VI children I have interviewed, and they link it to their idea of a good life, fitting in with peers and being independent. The term *literacy* has been described as *"[...] a*

complex cultural phenomenon with powerful ideological implications, which vary depending on the time, place, and milieu one is looking at." (Briggs 2000, 398) Literacy holds long and multifaceted histories and meanings within different areas. Until the 1970s, researchers mainly approached literacy as the ability to read and write print text. Knowledge should be obtained through literacy skills, by learning to decode letters into words. In this regard, knowledge was considered "true", objective and static in the world, and knowledge was something to *receive*. Literacy was considered cognitive skills that a person could hold. (Gee 2015) Books held knowledge, and the reader was the receiver of this knowledge. This is today referred to as the Autonomous model (Brandt and Clinton 2006). There have been two major shifts within literacy research the last 50 years, and in the following, these two are briefly introduced, as this also have implications for my approach to knowledge and practices, throughout this thesis.

In the 1970s some researchers began to question the simplified "received" skills of literacy, and how it should be approached (Street 2013). New disciplines such as cultural psychology, anthropology and history contributed to a change towards social constructivism, where literacy, and knowledge, was considered constructed in relation to its social context (Beach et al. 1992, 14). Throughout the 1980s more studies joined this new approach, arguing that literacy should be understood by studying the subjects *engaging* in it. These literacy activities needed to be studied through observation, and in the 1990s anthropological and ethnographic studies greatly influenced the educational field. (Friesen 2014) These new disciplines, and their agreement of literacy being coexisting with social, cultural and historical contexts, is today referred to as the New Literacy Studies (NLS) (Gee 2015). The NLS approached literacy, and knowledge, as a social situational practice rather than something one could "receive" from a book (Street 2013). With this came a new understanding of the meaning of literacy skills themselves; literacy was not only reading and writing, it was about using this knowledge in a specific situation. Literacy was considered meaningful, and learners were motivated to use their knowledge; they were not simply decoding symbols. (Friesen 2014) Thus there was a shift in paradigms towards an Ideological model, initiated by the NLS, where literacy was understood as situated in practices. (Brandt and Clinton 2006)

Building on NLS from the 1980s, where literacy mostly related to print text in books, researchers in the early 2000s started to focus on different objects, mediums and digital technologies e.g. images, videos and symbols. Literacy became *literacies*, with the implication

that literacy involves more than understanding print *text*. (Gee 2015) Different modes of communication and language became a focus, called *multimodality*. Rather than primarily examining social practices, situations and communities in relation to literacy, multimodality studies focuses on various mixes of modes, signs and semiotics. To simplify this shift; multimodality is concerned more with the various *mediums* or *objects* used by people to create meaning, whereas the NLS focused on *people in practices* and their creation of meaning. (Kress and Street 2006)

In this study, I regard literacy as the ability to read and write, and to understand and use one's knowledge in a specific context. Further, literacy is not only a social practice, but a *sociotechnical* practice, in this study. Within this lies the importance of the mediums and objects used in this practice. Because I approach the specific field of blind and VI children, I will take *inspiration*² from multimodality, in that literacy involves various modes of information; audiobooks and braille are also relevant within literacy activities. Thus, I consider literacy as reading, writing and understanding words with and through different mediums, formats and devices, or: *technologies*.

Technologies as Objects of Perception

In the following, I introduce how I approach and define technologies in this study. This is partly based on structured literature reviews on literacy for blind and VI children conducted in two peer-reviewed journals; *Journal of Visual Impairment & Blindness* and *The British Journal of Visual Impairment*. For a detailed description of search-strings, limit of search and approach, see Appendix.

Technology is a frequently debated area in research of literacy for blind and VI children. The term 'technology' is however at times used synonymous with *digital* technology, or, it is not specified³. A large theme within studies of people with disabilities or special needs is *Assistive Technologies*. These include any object, whether digital or non-digital, that can support, maintain or increase a person's participation, well-being or functions (WHO n.d.b). Research of blind and VI children frequently involves Assistive Technologies⁴ (AT) and include both digital

² Multimodality involves specific combinations of two or more mediums; this I will not be working with.

³ (Bickford and Falco 2012; Martiniello, Wittich, and Jarry 2018; Sharma et al. 2010; Verdier and Ek 2014).

⁴ See Appendix for main themes found in literature reviews.

and non-digital technologies⁵. AT for people with a visual impairment can thus be anything from a blind cane, to a magnifying glass or a special lamp. It can also include digital technology like special software for magnification, or a GPS device that speaks. It can be any object, used in a *beneficial* way, in order to be defined as AT.

Due to these multiple definitions, or lack thereof, it is crucial to define 'technologies' in this study. I regard any object in the world, whether in use or in a background, as technologies. This include physical artifacts e.g. books, paper and lamps and also digital software, hardware and devices. Technologies thus refer to objects and programs that can be perceived in any form. Siu Yue-Ting, a researcher and TVI, writes how to approach a field of visual impairment and *Assistive Technologies*, and argues that a researcher should not start with a focus on specific technologies. Rather researchers should locate issues and *then* find possible technological solutions. (Yue-Ting 2019) What makes me curious is that she, like other researchers within various fields, places technologies as 'problem solvers' and the human practices as where one finds the problem. Because I approach literacy activities as *socio-technical*, this distinction does not make sense. "*Assistive* Technologies" imply that they are *beneficial* technologies. Therefore, the focus in this study will initially be on *literacy technologies*, that are not *necessarily* beneficial; they can have multiple roles in various settings.

Literacy Technologies for Blind and Visually Impaired Children

Literacy technologies I generally define as books, paper, pencils and even the lamp that is used to see a text. It also includes computers, smartphones, tablets, and any other device in which any person can practice literacy. Blind and VI children can at times participate in literacy activities through different mediums; auditory or tactile. To specify, I will introduce some literacy technologies for blind and VI children that are mentioned in this study.

⁵ (Zhou et al. 2012; Kelly and Smith 2011; Siu and Morash 2014)



Figure 3: From fieldwork



Figure 2: (Wikimedia Commons 2012)



Braille is a system of dots that represents alphanumeric characters and should be read using fingertips (Roth and Fee 2011). Braille can be read in a non-digital format, e.g. on medicine boxes or in braille books, and through digital devices such as a *braille notetaker*. A braille notetaker has refreshable pins that represent a braille display, shown in figure 1. These devices can be used on their own, or together with e.g. a computer as a display. *Writing* braille can also be done on manual typewriters or digital notetakers. (Bickford and Falco 2012) Thus, braille *always* exists in a physical form as a *tactile medium*.

VI children can use specially made closed-circuit televisions (CCTV's) for magnifying physical text; e.g. handwritten letters and books (Kelly and Smith 2011). It can be described as a digital magnification device that can be helpful to enlarge physical objects. Some CCTV's can also be directed at specific areas in a room so the student can see this close-up on the screen. A CCTV for VI people is shown in figure 2.

Another device is a dome magnifier; a small dome shaped tool made of glass or acrylic to enlarge any print text (Vision Enhancers n.d.). A dome magnifier can be used to read print text for a VI person and is shown in figure 3.

Various software for VI children can be used for magnifying; these can range from build-in software e.g. in smartphones, to special software made for extreme magnification. Other software for literacy can be auditory, e.g. text-to-speech, where written text is presented through an auditory medium. (Martiniello, Wittich, and Jarry 2018) Audiobooks I thus also regard as literacy technologies.

All these devices, tools and mediums I define as literacy technologies for blind and VI children, and they are further explored in chapter 6. I have approached this field by asking educators about literacy technologies in practices, because I regard human practice and technologies as coherent. In 2006 researchers in the English language Deborah Brandt and Katie Clinton (2006) called for studies that builds on the New Literacy Studies approach to the social and cultural aspects of literacy, *while* using the advantage of multimodality in understanding *technologies* as *active*. They called for studies that interpret the *mediation* between humans and technologies. (Brandt and Clinton 2006) This is partly the intention of this study, with a phenomenological approach to 'active' technologies in literacy activities. The reasoning behind the scope, approach and format of this study, is based in my Techno-Anthropological background, and my journey into this field.

2.4. Techno-Anthropological Interdisciplinarity and Experience

Because I approach knowledge phenomenologically, and based in my own subjective experience, I myself as a researcher and writer, produce what I consider meaningful and relevant. I interpret and create a story through writing, and my own road towards this thesis has relevance for the outcome, along with my interdisciplinary positioning as a Techno-Anthropologist. Because this is my Master Thesis, I intend to briefly reflect on my academic practice, and how I consider this thesis, before returning to the scope of this study.

This Master Thesis represents a closing chapter of five years studying Techno-Anthropology at Aalborg University. The officially used hyphen between "Techno" and "Anthropology" represents the bridging between technologies and humans⁶. Techno-Anthropologists have an *interdisciplinary* approach to knowledge. This means that there is no standardized "Techno-Anthropological discipline" present. Neither is there a dominant discipline, e.g. Anthropology, with another discipline slightly incorporated, as would e.g. be the case with *cross*-disciplinarity. (Børsen 2013) What a Techno-Anthropologist like myself strive to *be* is interdisciplinary, where elements of social sciences and elements from specialized, often technical, fields are combined, along with a wide variety of other skills which I will not go further into here. Interdisciplinarity can lead to constant debates of how a Techno-Anthropological project

⁶ Although this subject-object distinction can be, and have been, heavily debated.

should be written, and what it should, and should not, include. Techno-Anthropological projects at Aalborg University are being supported and evaluated by researchers from various disciplines ranging from engineering, philosophy, anthropology, environmental research, physicist and anything in between. With different epistemologies, scientific traditions, methodologies, along with individual perceptions and opinions of what is considered 'good practice'; a Techno-Anthropological student and *researcher* is at constant work. The task is to try and find a position, something on which one can take a stand and be critical and curious of longstanding disciplines' traditions; finding an academic identity. With no historical broad discipline-shoulders to stand on, this is challenging. However, it is in this challenge I find my academic identity; as a Techno-Anthropologist who is interdisciplinary, socio-technical and can approach real-world phenomena within different thought-collectives (Fleck 1979, 38-39) and approaches.

With this, I do not have deep expert knowledge within one field, in which I can place myself, and it can be questioned whether it is beneficial, if one has no disciplinary "home". However, I do regard interdisciplinarity as valuable because it invites a broad notion of what knowledge is, a constant search for unexplored areas, and a critical student who can reflect individually. This I regard as important to teach within any educational setting, and in the world more broadly. With the risk of being lost in disagreements of epistemologies and ontologies, within different thought collectives, I attempt to tell a story that is co-constructed by me, educators and children with visual impairments. In order to explore the phenomenon of roles of literacy technologies for blind and VI children in different settings, and technology and human perception more broadly, I intend to borrow concepts from diverse disciplines and frame these within the scope of this study. I thus place myself between disciplines with long standing histories, including educational anthropology, studies within disability, visual impairment, Assistive Technology, literacy, philosophy of technologies, and many more. The goal is to frame an interdisciplinary socio-technical account without going deep into science wars, and field traditions; I will leave this to other talented researchers. With this I intend to challenge the reader to explore what is unknown; in a non-standardized, Techno-Anthropological, interdisciplinary Master Thesis.

The scope and data in this thesis partly stem from my prior experience and passion in working with blind and VI people, educational technologies and phenomenological philosophy of

technologies. Three years ago, I did home-visits with users for a new digital system that I was designing. Here, I visited three elderly brothers who were all blind and lived together. I noticed how they had art on the walls, fake plastic flowers in their window frame and a wall clock – all technologies made for visual perception. I was fascinated, and this was my entry to working with blind and VI adults and how they use symbolic technologies, smartphones, blind canes, computers with special software and other Assistive Technologies. The relationship between humans and technologies became even more present to me, when I listened to, and observed, people who had a *distinctive* different non-visual perception than myself. I took a year break from this, where I did research on educational technologies for sighted children and adults. The perspective of teachers and how they use different technologies to facilitate educational practices became another passion. In August 2019 the field of visual impairment, and education of children merged. In a news article I saw that the LEGO Foundation was working on creating LEGO Braille Bricks; bricks that were representing the braille alphabet, with the corresponding letter printed on them. The bricks will launch in mainstream and special schools in 21 countries where blind and VI children are. I insisted on getting an internship at the LEGO Foundation to help with this project, with success. In 2019 I did interviews with TVIs, Assistive Technology developers, braille experts and mobility officers from different Western European countries, to understand the practice these bricks were being developed for. This knowledge I used, as I worked interdisciplinary with different stakeholders of the project in designing an international website for knowledge creation. A great part of this data is used in this thesis which I frame in the following chapter.

<u>3. Framing and Problem Statement</u>

Through the problem analysis I have determined how I refer to blind and VI children, disability and the educators in different settings. Further, I have determined that I approach literacy as a socio-technical practice including various technologies. The literacy technologies I consider *active* in human practices, and they include anything from text to a magnifying tool. I have described how I work interdisciplinary, which leads to various areas debated in this thesis.

With this, there are many possible fields, theories and perspectives that can be argued relevant to discuss within this study. The choices of perspectives have been made with the data as a point of departure, after it was coded. This means that all arguments are made from the emergent categories of this coding. The chosen literature is used with the aim to support, challenge or discuss data, in what I find essential. With this, I do not approach anthropological theories of cultural understanding of "disabled" people (see Reid-Cunningham 2009) as this is beyond the scope. Further, the various definitions of "culture" and "fields" will not be discussed in detail, because technologies in settings are the main focus of this study. I do however consider this entangled in cultural relativistic normalities (Benedict 1934). Some researchers find it necessary to limit their study to only include e.g. blind and not VI children, who do not have additional disabilities (Bengtsson, Mateu, and Høst 2010). In this study I approach children with various degrees of visual impairments, and some have additional disabilities. Because I focus on individual perception, I have not limited this study to one "type" of informants with a determined level of children's "remaining vision" or "cognitive abilities". I intend to approach them, and all informants in this study, as individuals regardless of some of these personal categorized traits.

This Master Thesis is based on interviews with educators for blind and VI children in different settings, and ethnographic fieldwork. I argue that literacy technologies take on different roles within different settings. The settings represent different visual and non-visual normalities. With a socio-technical approach to literacy practices and human *perception* in specific educational settings, I argue that literacy technologies can facilitate 'normal abilities' for blind and VI children, however that this 'normality' changes within different settings. Further I discuss how technologies, whether in use or in the background, mediate and shape practices and normalities. I debate this in relation to what is called "inclusive education" in Danish and

international mainstream schools. I describe *standardization* of technologies and practices in mainstream schools, and in a world that I suggest is more broadly standardized towards the majority. With this thesis, I aim to exemplify how technologies are not neutral, and that experiences belongs to individuals. This can be summarized with the following statement:

Based on interviews with educators working in mainstream schools and special schools, along with ethnographic fieldwork, I argue that literacy technologies for blind and visually impaired children take on different mediating roles, depending on the human perception that defines a normality of the educational setting, in which they are used. Further, I argue that technologies more broadly mediate normalities within any setting, which is discussed in relation to inclusive education in Denmark and elsewhere, in a world that I suggest is standardized for the majority of people.

4. Methodology: Data-Creation through Ethnographic Methods

In this study, I have interviewed educators for blind and VI children, along with conducting ethnographic fieldwork at a Danish event for blind and VI children. In the following, I introduce my approach to fieldwork, and the special ethical and perceptual considerations, in working with blind and VI children. Further, I describe my approach to co-creation of knowledge through interviews, and their technologically mediated embeddedness in a digital space of reflection. Lastly, I briefly describe my visually driven approach to handling and categorizing my data.

4.1. Ethnographic Fieldwork at Computer Camp

In 2019 I conducted ethnographic fieldwork in Denmark at an event called Computer Camp. The camp is a yearly event for blind and VI children, and their educators, family members or supporting adults. I gained access through an informant I was working with in connection with the LEGO internship, and was given approval from the organizers of the event. The camp lasted two days and was located at a smaller hotel with one floor and a large outdoor area. The adults at the camp included TVIs, teaching assistants, technical support, mainstream teachers, family members, supporting mentors and others. What made Computer Camp unique was that there were up to 15 blind and VI children gathered, aged between 6 and 16 years old. The children all attend mainstream schools, however they got time off to go to Computer Camp to learn about different literacy technologies.

I did participant observation, and would sit with the children and practice braille, play cards, assist with getting food or talk to educators and ask them about their practices. I carried out two days of ethnographic fieldwork, leaning specifically on *unstructured interviews* based on a specific theme, and *informal interviews* with a specific purpose along with stepping in and out of conversations that occurred between participants (Bernard 2006, 211-212). I did constant *jottings* during the days, and sometimes I would leave dinner early, to go straight to my notebook. I wrote *proper fieldnotes* as soon as I got home, trying to capture as many details as possible (Bernard 2006, 389-391). I had brought a prototype of LEGO bricks with braille on them, because the organizers of the camp asked me to. This gave me the opportunity to give back to informants, and I could further get educators and children's opinion on the bricks which

was useful for the project with LEGO. Because I had brought the bricks, I clarified that I was doing research for my studies and although I was working *with* the LEGO Foundation at the time, I was not working *for* them. Most had positive comments and were glad that *someone* did research in their "small field". Others expressed skepticism regarding "academic" research, not in terms of my research per se, but against academics when used as a reference point for educational practices regarding blind and VI children. The children knew I was there to observe and learn from them, however they might not have known in all situations. Informed consent is crucial in research, however when doing participant observation, it can be a challenge (Hammersley and Atkinson 2010, 210). I was as honest with the children as with the adults, although the wording was different. Sociology researchers Martyn Hammersley and Paul Atkinson write about ethnographic practices and the role of a participant observer; *"It is hard to expect 'honesty' and 'frankness' on the part of participants and informants, while never being frank and honest about oneself."* (Hammersley and Atkinson 2010, 72)

The Visual Observation of Blind and Visually Impaired Children

The children at the camp had various types of severe visual impairments, and this calls for considerations on participant *observation*. Observing someone, largely through vision, who cannot observe me back from a distance, changes the relations between the observer and the observed. Hammersley and Atkinson write:

"We live in visual cultures, and we base much of our claim for ethnographic research on the value of participant **observation**. While 'observation' in this context means far more than just watching, of course, it ought to remind us that the visual aspects of culture, and the observational aspects of research, should not be overlooked." (Hammersley and Atkinson 2010, 207)

The authors relate this to how one can represent ethnographic work through different media, e.g. audio and video, however I regard it as particularly relevant when working in a field with blind and VI children. It calls for considerations of 'spying', because although I sit close and 'obviously' observe, the *children* might not be aware in all instances. I was aware of this during my fieldwork, and I would often go back to a child and talk with them about my observations. I ensured that the children, and their responsible adult, both approved before I took photos of their hands, however this could be challenging as described in this fieldnote;



I ask [the blind boy] if it would be ok if I took a picture of his hands [...] He sticks out both his hands in front of me and just rest them there, [as] if I wanted to take a picture of his hands only. I tell him that he shouldn't do that, and he should just keep working as he normally does, so I can take a picture of how he is using his **device**. He keeps working and asked if he should do anything special, and I feel like he really wants to please me with this photo.

Fieldnote 10/10/2019

This is a good example of challenge of *reactivity* from informants, where they are aware of an audience and can change behavior. Informants can either show the observer what they want me to see, or try to please me, as was the case in this example. (Bernard 2006, 354; Hammersley and Atkinson 2010, 102) I did however find it important to ask both children and adults for permission. I asked this boy to show me something on his notetaker and took a photo while he was showing me: this way I got permission and the photo would represent his position of his hands *in practice*. At times I would also observe the children without disturbing them in their activity, in order for me to observe their expressions in a practice with each other. This was a constant judgement on my behalf, between valuable data and ethical considerations.

Ethical Considerations in a Small Field

Hammersley and Atkinson write:

"Ethical issues are not matters on which simple and consensual decisions can always be made. It is our view, however, that the most effective strategies for pursuing research should be adopted unless there is clear evidence that these are ethically unacceptable." (Hammersley and Atkinson 2010, 225)

Children at Computer Camp, along with educators interviewed, have been anonymized and have been named with aliases corresponding to their nationality. However due to visual impairment being a low incidence disability, the educators and their students can more easily be identified. Information that would otherwise be considered as acceptable to disclose, need more careful consideration within this small field. In order to anonymize children and adults, the specific schools and regions the educators work in, are not disclosed. In Germany and the UK there are only a few special schools, and the details of regions are therefore not included in this thesis. In Denmark there might only be e.g. one blind boy who attends a special class, in one specific region. The specifics of the children's visual impairment and their related diagnoses have been considered, along with other specific traits, preferences and abilities. The age of the children is known by me, and although this can have great relevance in some instances, I do not disclose this, in order to ensure anonymity. Although this limits the range of examples that can be presented, I regard it as a necessity to protect educators and the children. The examples used are therefore not specifically related to age, or the child's specific traits.

4.2. Interviews as Primary Data-Creation

The data used in this study is mainly from interviews of seven educators of blind and VI children. Some interviews were conducted in late 2019, in connection with the LEGO internship. The themes from these interviews continued, although outside of the internship framework, in the interviews conducted in March of 2020. In the following I discuss my practical approach, reflections on knowledge-creation, Skype's technical challenges and embeddedness of interviews.

Criteria, Access and Approach

I had two criteria when finding informants; the first being that they had teaching experiences with blind or VI children in an educational setting, and the second being that they had worked with literacy activities. Further, I ensured that the informants identified either as a mainstream teacher, a teaching assistant or a TVI to approach various qualifications. TVIs from the Computer Camp were helpful gatekeepers, as they agreed to pass on my contact information, criteria and initial project scope to other educators. The TVIs could then vouch for me to be professional, discrete and respectful. The approach resulted in informants who trusted me, and who sought to speak to me. Given this approach, I did not have contact with educators who might have been more critical or hesitant. Many more possible stories could have been unfolded from a different approach.

I prepared each interview with an interview guide, containing questions about *literacy and* educational practices involving blind and VI children. Interview guides are beneficial when conducting multiple interviews for comparable data (Bernard 2006, 112) however they will mediate the interview itself, as it essentially affects the openness of the interview (Barker 2012, 59). In this study, I did not make the guides from predefined research questions but approached the educators more broadly in order to understand what they regarded as important, in relation to the field. The interview guide thus represents a fine balance between the interviewer being prepared with questions regarding a field, while letting the informant introduce new themes that they find relevant (Bernard 2006, 212). This is closely related to the epistemological approach I have towards literacy, where I dismiss the Autonomous model's notion of knowledge being 'out there'. Rather I regard knowledge as *created* in practice, which is also the case with interviews; the informant is a co-constructer of knowledge (Borer and Fontana 2012, 48). Kvale and Brinkmann (2015) describe this difference in interview epistemology through metaphors; the interviewer can be considered a mineworker who seeks to 'find' existing knowledge, or they can be a traveler who creates knowledge with informants (Kvale and Brinkmann 2015, 77-79). I identify with the traveler, as I create knowledge; there is no knowledge "out there" to be "gathered". With this the interview guides and semi-structured nature of the interviews, was part of this co-creation of knowledge, in practice. I recorded the interviews and transcribed the audio-files myself. During the interviews I further took notes, which allowed me to write down reflections during the interviews and note follow-up questions as the informant was speaking (Bernard 2006, 231). Before conducting interviews in 2020, I listened to all interviews from 2019, and finished some who had not been fully transcribed. I then had a better understanding of data I had, before creating new knowledge.

Skype as a Virtual Setting and Related Challenges

It is of note that the interviews were all done from a distance, mainly through Skype. This is partly because some informants were from outside of Denmark, but also because interviews conducted with Danish informants in 2020 were challenging, due to the outbreak of a pandemic that required new considerations. This meant that both the informants and I were physically distant from each other, *and* the physical educational settings they were describing. Michael Ian Borer and Andrea Fontana, sociologists and professors at University of Nevada, write about postmodern trends in interviews (Gubrium et al. 2012, 606-607). Borer and Fontana (2012)

describe distant interviews as a postmodern trend where "*interaction centers on "virtual" respondents and "virtual" interviewers, to which we might add the "virtual" researcher, all of whose empirical groundings are unclear.*" (Borer and Fontana 2012, 52). This changes the relation, and needs to be addressed. In this study, I have pointed out that I consider technologies as *active* in human practices, and therefore it is crucial to address the effects of digital technologies in my own research practices.

Interviews conducted with TVIs from the UK and Germany from 2019 were done through Skype in order to have a wide reach cross country. Interviews with Danish educators were conducted in late March 2020, when the Danish Government recommended that citizens took individual measures in order to limit the spread of Covid-19 virus (Regeringen 2020). Inevitably the lockdown of Danish schools, and the educational systems being in an unusual situation, affected my data-creation methods. The ethical responsibility for me as a researcher and citizen changed during this period, with health risks and a new social order being of importance. Skype is however acknowledged by researchers as a useful tool to conduct qualitative interviews (Janghorban, Roudsari, and Taghipour 2014), however as with any interview-approach it has benefits and limitations. A Skype interview has some technical limitations e.g. sound issues, bad internet connections and different programs not working. Further it does not provide the same visual clues that I traditionally use as a sighted researcher, with face-to-face interviews; e.g. body-language, eye-contact, direct response time etc. (Seitz 2016) To accommodate for some of these limitations, I did extensive testing of sound beforehand, while ensuring that my informant had the correct programs and contact information. Further, I gave the informant extensive auditory or visual confirmation during the interview, to let them know I was listening and present as they spoke. Some issues I was not able to overcome, however Skype interviews also have advantages both in relation to access, ethics, comfort and interaction.

Skype interviews allowed me to overcome geographical distances, which in the case of interviewing foreign TVIs held a great value. Further, interviews during the Covid-19 outbreak became *responsible*, as it allowed me to be in a digital room with my informants without having the risk of contamination. Skype interviews, in this unusual period, I regard as superior to face-to-face interviews, because the latter would have introduced a possible health-threat. One large benefit of Skype is that it has video, however I decided to let my informants choose whether they would like video or not. I did this in part because the comfort of not being studied proved

to be a preference to some: one of my informants said at the beginning that she did not want video because "audio was fine", and another informant was blind, and preferred not to turn on her camera. The latter example relates to what I have discussed in terms of the observer and the observed, during fieldwork. In these situations, I regard it as important to make the informants feel as comfortable as possible, and Skype allowed me to "turn off" my own visual perception.

Embeddedness of Knowledge-Creation

Interviews are practices where the informant is often distant from the practices they describe (Borer and Fontana 2012, 50) and so is the case of me as the interviewer. Joshua Barker is a professor at University of Toronto who does anthropological research within the area of science and technology studies (University of Toronto n.d.). Barker (2012) regards this distance as part of the level of *embeddedness* of interviews; to which degree interviews are conducted in the world one is studying (Barker 2012, 55). The informants and I were mostly distant from the educational settings during the interviews, because the schools in Denmark were closed due to the pandemic, and the foreign TVIs were mostly at their homes. Although *ethnographic* interviews can often be related to a high level of embeddedness, Barker argues that;

"[...] we have to recognize that there is no such thing as a disembedded interview. An interview that takes place in a laboratory is as deeply embedded as one that takes place on a boat; it is just that it is embedded in very different kinds of social fields, discourses and sets of practices." (Barker 2012, 57)

For example, in one Skype interview with a rehabilitation specialist for blind and VI in the UK, my informant was at his office where he worked as an official. He was nervous, whispered and hesitated during the interview, and immediately after we hung up, I received an email from him, stating details he was scared to say out loud at the office. Such incidences illustrate the effect of a setting of an interview, and it can have both positive and negative consequences. Most of my informants were in their own homes, a familiar setting, which can make informants feel more comfortable (Seitz 2016).

Part of Barker's definition of embeddedness is also the researcher's own *knowledge* about the social field they are studying (Barker 2012, 55). Prior to all interviews in this study, I did have some knowledge on visual impairment, technologies for this group, and the educational area for sighted in Denmark. I also did extensive literature searches in order to map out educational systems for blind and VI children in Western European countries before all interviews. Although this prior knowledge can lead an interviewer to have pre-assumptions, it can also allow for a deeper understanding of the complexity of the field, and thus create more nuanced questions and conversations (Johnson and Rowlands 2012, 103). The educators *were* asked to explain some topics again, in order for me to explore their understanding. Overall, I consider the virtual setting through Skype, as embedded in both the informants' and my own knowledge of the themes we discussed; thus the knowledge was co-created in a virtual setting embedded in our mutual reflections.

4.3. Coding and Categorization of Data

Transcriptions from interviews along with fieldnotes resulted in approximately 130 normal pages of text. Due to the small sample, and because I personally memorize better when reading on physical paper, I did physical sorting of data. Hammersley and Atkinson write: *"There is little doubt that when handling small data sets, such simple procedures can serve users just as well as more complex data-handling software."* (Hammersley and Atkinson 2010, 154) I had the physical space needed to sort this data, and through color-coding and categorization I could get a better overview of the data and patterns within it. I read through all data, before marking interesting parts in a second read-through, with no specific focus. Following this, I cut out the data pieces and categorized them in themes I discovered e.g. "teacher practice" "learning braille" "being blind" etc. with colors representing where the data originated from.



Following this I went back over all categories and reorganized, merged or removed data. This was a cyclical process (Saldaña 2012, 58), resulting in many categories, with some smaller categories drawing my attention, regarding inclusion, independence and a category simply named "normal". Although time-consuming, it gave me a deep knowledge of my data. Further, it allowed me to easily recategorize, and have a *visual* overview, which I prefer. In addition to this, I worked with a digital document with all data collected. This enabled me to search specific terms used by informants or find a context for an exact passage. I digitalized most of the manual categories using *In Vivo Coding*; using two or more of informant's own words as a code (Saldaña 2012, 91). This is illustrated below, and was useful to trigger memory, while quickly being able to find the data digitally.

Normal
Lamps annoying
Pdf no (hun brugte helst)
(når de brugte bøger) (det gjorde da andre ikk)
(ordblinde elever heller vil have bøger)
(lampe på sådan nogle rullefødder)
(the children learn this mysterious thing called braille)
Mobilen (der skillede hun sig jo ikke ud)
(kommer vores børn til gode – mobil – her kan hun jo også navigere rundt med den – men d
også meget isoleret – frygtelig stille – har ikke verbale kommunikation)
Krystal good (skide godt)
A3 good (nøjagtigt de samme bøger)

Hammersley and Atkinson write: *"The various systems – including currently available software – differ in appropriateness according to one's purposes, the nature of the data collected, the facilities and finance available, the size and scope of the research project, as well as personal convenience"* (Hammersley and Atkinson 2010, 156) These methods helped me to organize my material. They were beneficial due to the iterative nature, which allowed me to create and recreate analytical valuable patterns in the data, presented in this study.

5. Phenomenology of Perception, Technology, and the World

I have clarified that I approach literacy technologies in this study as *active* along with the human as *active* in creating meaning, all situated in a specific setting. To unfold what this 'active' means I turn to phenomenology and how human *perception* can be mediated through *objects* and vice versa. Within phenomenology, knowledge is approached through human perception, and perception is more than vision. Phenomenological perception I regard as valuable, especially when exploring how educators *experience* practices involving children, who have limited *visual* perception. Phenomenological philosophies can unfold these described experiences, along with relations between humans and technology. Within the terminology of post-phenomenology, I aim to describe the roles of literacy technologies as embodied and multistable, as they are mediating humans' relation to the world. In the following I briefly introduce phenomenological and post-phenomenological philosophers of technology before applying it in the analysis.

5.1. Experience through Embodied Perception

Within phenomenology, the notion of perception is key in understanding how humans are in the world. The 'world' is not something in itself; to Martin Heidegger, a German philosopher of phenomenology born in 1889, it is connected to the *human experience* in our *"being-in-*the-world" (Dasein⁷) (Dreyfus 1991). Simplified, Dasein can be translated to "being there", and to Heidegger, humans will always be *somewhere* and experience *something* – the world (Heidegger [1954] 1977). I return to this being-in-the world in subchapter 7.4. French phenomenologist Maurice Merleau-Ponty builds further on the notion of being-in-the-world in his book Phenomenology of Perception ([1945] 2012). He argues that humans experience the world through *embodied* perception. I have mentioned that the Autonomous model within literacy studies approached humans as passive receivers of knowledge. This can be said to be what Merleau-Ponty rejects; the matter of knowing *something* is through the experience of it. This experience is *actively* created through perception, and perception is *embodied*. Merleau-Ponty suggest that objects (what I call technologies) exist in the world for humans to *perceive*, while

⁷ Dasein has been translated to both "existence", and "openness-for-being" in the text from Heidegger ([1954] 1977). I refer to Dasein as "being-in" or "being-there"; related to "the world". Thus "being-in-the-world" refers to the world of human Dasein; the world of everyday human existence and experience of it, and in it.

objects are also something *through which* the world can be perceived. He exemplifies with a blind man's cane:

"The blind man's stick has ceased to be an object for him, it is no longer perceived for itself; its point has become an area of sensitivity, extending the scope and active radius of touch, and providing a parallel to sight." (Merleau-Ponty [1945] 2012, 127)

Merleau-Ponty suggests that the use of a blind cane is an embodied experience; the cane is not an object in the world, it is part of the embodied perception. In this study I similarly approach the world as it consists of technologies to be perceived, and technologies to perceive *with*. Thus the educational settings consist of technologies both in the background and in use. Merleau-Ponty includes people who are blind, to illustrate how perception is beyond vision, and subjective to our bodies. He argues that the world is perceived differently for every human in an embodied way. This is coherent with my approach to knowledge, in that I consider it cocreated. The educators interviewed in this study are describing how *they* perceive the world, which in turn is interpreted through how *I* perceive the world. There are multiple interpretations in this study, and thus I do not describe a world 'out there'. Rather, I seek to explore and interpret educators' words, and include my own perceptual *experience* of these, and blind and VI children at Computer Camp. Thus, I do not claim to *know* how any person perceive the world, but I do suggest that I can interpret and analyze *my experience* of *their* expressions. Similarly, Merleau-Ponty *interprets* the differences of perception between the blind man and the sighted person, the latter which Merleau-Ponty calls a "normal person":

"The blind man's world differs from the normal person's not only through the quantity of material at his disposal, but also through the **structure** of the whole. A blind man knows quite precisely through his sense of touch what branches and leaves, or an arm and fingers, are." (Merleau-Ponty [1945] 2012, 201)

In the analysis I return to how I use the terms 'normal' and 'abnormal' to clarify the differences between visual and non-visual perception. Further, in chapter 7 I explore how the physical environment can affect human practices more broadly.

5.2. From the Question Concerning Technology to Mediation in Practice

In this study, I approach individual technologies in how they take on different roles within specific settings. To do this, I draw from Don Ihde (1990) and his post-phenomenological terminology. Ihde builds on Merleau-Ponty's arguments of embodied perception and Martin Heidegger's phenomenological philosophy of technology. In a translated version of *The Question Concerning Technology*, Heidegger wants humans to understand our relations to the Wesen (essence) of technology; Wesen⁸ he relates to a Gestell (enframing) technology has when it calls for humans to do something with it (Heidegger [1954] 1977). This Wesen is not technological; it is not found in a single artifact. Wesen is found at a broader level and applies to *Technology* (capital) as an ontological phenomenon. (Verbeek 2001) Heidegger argues that Technology should not be regarded as neutral;

"Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it to which today we particularly like to do homage, makes us utterly blind to the essence of technology" (Heidegger [1954] 1977, 4)

Because Technology *has* an essence (Wesen), this essence *needs* to be understood. In my simplified interpretation of Heidegger, materiality has some *action* and humans should not believe it is simply a passive 'matter' that we can manipulate freely. Heidegger's philosophy of Technology and existence is however more complex. What I regard as important is Heidegger's understanding of Technology not being *neutral*, and of Technology having *essence*. This is relevant in understanding post-phenomenologists such as Don Ihde, who, like myself, is more concerned with the role of technologies; technological *artifacts* within their specific contexts (Verbeek 2001, 122). Don Ihde is an American post-phenomenologist who builds on Heidegger's understanding that Technology should not be considered neutral. Ihde however regards the notion of Technology and its 'essence' as limiting, because *technologies* can only exist in the way they are used:

"Indeed, I contend that while [Heidegger] claims that attending to the particularities of technologies as anthropological-instrumental entities blinds one to the "essence" of technology,

⁸ The translation of 'Wesen' is complex, and the translator most often translates to "essence", however; because Wesen is not stable, it is also occasionally translated: "to come to presence". (Heidegger [1954] 1977)

the inverse is also the case. To attend to the "essence" of technology, I argue, blinds Heidegger to the differing contexts and multidimensionalities of technologies that a pragmaticphenomenological account can better bring forth."⁹

What Ihde suggests is that because Heidegger tends to the broad notion of Technology and its essence, it makes him unable to see how technologies *only* exist in a context. Rather than Technology having an essence, Ihde argues that individual artifacts can have multiple interpretations depending on the specific use in a *specific context:* technologies are what he calls *multistable* (Ihde 1990, 145). I adhere to this view of Don Ihde, as I intend to focus on individual literacy *technologies* (plural) or a *technology* (singular), and how they change roles within different *settings*. Several scholars approach technologies as not being neutral. Technologies can be considered actors in actor-networks, known from works of Bruno Latour, Michel Callon and John Law, where technologies also do *mediate* (Olesen and Kroustrup 2007). Technologies have been described as *fluid* in different contexts of use, and thereby not "fixed" in their entity (Laet and Mol 2000). They can be approached as socially constructed, or as technologies that are constructing the social (Lauritsen 2007, 43). Technologies are considered many things, however in this study I mainly stay within the post-phenomenological terminology, due to the advantages of describing embodied perception that goes beyond vision, while recognizing that this is only *one approach amongst many*.

5.3. Multistability, Intentionality and Embodied Relations

Multistability can be described beyond visual perception, however Ihde prefers to illustrate multistability through *optical illusions* and how they are perceived differently for individuals. For the sighted reader, an example is therefore given below in the figure description.

⁹ Ihde, Don. 2010 pp. 114-115. *Heidegger's Technologies: Postphenomenological Perspectives*. US, UNITED STATES: Fordham University Press. Quoted in: Scharff 2020.



Figure 4: (Wikimedia Commons n.d.) Ihde uses the Necker Cube to illustrate multistability; the cube's top left corner can be perceived as the furthest point, however it can also be perceived as the closest point; thus the "same" cube changes; it is multistable in the individual perception of it. (Ihde 1990, 146)

Multistability however involves much more than *visual* perception. A book can be multistable, because in a setting of a home, it can be used to have an experience of a fairytale, and in a setting of a school be used to achieve the skill of decoding letters. In a home of an artist, a book might have the role of pressing flowers flat, or at the office where one writes, act as a coaster for a coffee-cup. As much as these settings, practices and people are changing the role of the *book*, the book can reversely define the setting, practices and people it exists with. The book is multistable because people use it differently in settings and situations, but also because they *perceive* the book differently. The New Literacy Studies approach literacy as a human practice, where the person creates *meanings* in specific *situations*. However, I intend to demonstrate that literacy technologies *themselves* are a key part of that creation of this experience in practice. Because the book can act as an experience in itself, or it can have the role of a coaster, this can determine what the book *is* or means to the particular person using it. Reversely, the book has something that mediates; *intentionality* (Ihde 1990).

Ihde argues that technologies have intentionality, as well as humans. When a person is e.g. wearing a hearing aid; this person perceives the world *through* the technology, and the experience of the world is mediated by the hearing aid, because it has intentionality (Ihde 1990, 73). The person and the hearing aid are thus in what Ihde calls an *embodied relation*. This is building on Merleau-Ponty's examples with the blind cane, and Ihde also exemplifies this with a person using glasses: the person-with-glasses becomes an entity that perceives the world. Ihde writes:

"In the magnificational capacity of the eyeglass, there is a certain shape to its technological 'intentionality.' Magnification selects the panorama in a certain way, and in the process, there is a change of both time and space. My seeing **as** is a magnified seeing **as**." (Ihde 1990, 48)

This embodied relation is exemplified throughout the analysis, where educators describe what I interpret as child-with-technology that perceives the world. Technologies are not 'fixed' or neutral; they are multistable because the human has intentionality toward the technologies and vice versa. "*Technologies transform experience, however subtly, and that is one root of their non-neutrality*." (Ihde 1990, 49) It should be noted that other humans around us, personal beliefs, infrastructures, culture etc., can further mediate the human experience of the world. Further, human relations with the world are never considered *unmediated* within post-phenomenology, because human *interpretation* is always the least mediating factor. (Verbeek 2001)

With this, I approach technologies in different settings and situations, where technologies are used and (possibly) *perceived* differently depending on the context. As stated, I cannot *know* how my informants perceive, however I interpret their stories and use of words, to argue that technologies take on different roles. From Heidegger, I refer to the *world* as it exists in our *being-in-the-world*, and Merleau-Ponty's philosophy frames the *embodied* perception and how this is beyond vision. The terminology of post-phenomenology frames the *embodied relation*, *mediation*, *multistability* and a shared *intentionality* between humans and technologies, in humans' relations with the world.

6. Analysis: Literacy Technologies in Different Normalities

A young blind boy sits at a piano at Computer Camp:

He centers himself on the chair, so he can reach the entire [keyboard], even though he has small arms. He starts playing a song, using his left hand to play the bass, and his right hand to play the melody. It sounds wonderful, truly impressive, not because he is blind, [but] because he is so young and still able to play so nicely. I go to his [teaching assistant], and tell him that it is very impressive, and he tells me that this is the place where the boy feels like he is normal, in comparison to other children.

Fieldnote 10/10/2019

This fieldnote was taken during the first hour of my two-day visit. Whether a child is feeling "normal" or feeling "abnormal" is a complicated matter; something I cannot fully discover. What I can and will explore in this analysis is how educators *describe* their own expectations, practices, opinions and the way they teach blind and VI children. I frame their stories, and my own observations, within the concepts of 'normality' and 'abnormality'; concepts I suggest are changing, depending on whether the setting is defined by visual or non-visual perception. Literacy technologies take on different roles, depending on these different normalities, and the children are in close relations to these technologies. The students in this analysis are blind or VI, but they are first and foremost individuals; children that knows what other children around them are doing, who wants to fit in, and who wish to accomplish great things. Their educators are teaching them social abilities, norms and literacy, like with any other student. What differs, is that blind and VI children do not have full visual perception, that the majority of people have; and this affects much of this teaching.

The analysis is structured in two parts, based on educators' stories and my own observations in two *types* of educational settings. In the first part of the analysis (6.1. and 6.2.) I approach the known settings; that of mainstream schools, mainly in Denmark. I initially describe mainstream school settings, and what I define as normalities within these. This is followed by a discussion of the roles of literacy technologies, within mainstream school settings. In the second part of the analysis (6.3. and 6.4.) I take the reader to unknown settings; these I call *blind settings*. Here,

I describe a different normality, followed by my analysis of how the roles of literacy technologies change in these settings. Initially, I introduce the anonymized educators that I have interviewed in this study.

Introduction to Educators Interviewed

In this analysis I compare expressions by educators from Denmark, Germany, the UK and France. Although the educational systems of blind and VI children are very similar across these countries, there are of course cultural, political and historical differences. Therefore, I will only draw on examples that does not relate specifically to national policies, infrastructures and other differences that would make it incomparable. This approach is clarified better throughout the analysis.

Anna is a Danish TVI who works with blind and VI children in kindergarten and mainstream schools. She is currently working with a young VI girl who is about to start school. Anna has many years of experience working with blind and VI children, ranging from teaching mobility to literacy practices.

Bodil is a Danish mainstream teacher who previously had a VI girl in her class, for more than five years. Bodil teaches Danish and have more than 30 years of experience in mainstream schools, but no prior experience with teaching a VI child. Bodil attended a course at Refsnæs for a week, and a two-day course arranged by TVIs to learn how to teach a VI student.

Diana is a Danish mainstream teacher who worked with a VI girl from 1st to 4th grade, both as her teacher and as teaching assistant in other classes. Diana has many years of teaching experience, and also works with sighted children with dyslexia. She attended a three-week course at Refsnæs to learn to teach her VI student.

Charlotte is Danish and has worked as a teaching assistant for a blind boy with additional needs, for the majority of his school days. The boy is referred to as blind, because he has no light perception. Charlotte was his assistant in a special class, for children with different additional needs, in mainstream school. The boy was however the only one in class with a visual impairment. Charlotte has no education within pedagogy or teaching and have taken a course at Refsnæs for a week to learn how to support a blind student.
Mia is a German TVI working at a special school for blind and VI children. Mia is blind herself and reads braille fluently. She teaches English and have more than ten years of experience with teaching blind and VI children and adults in multiple areas, both in and out of educational institutions.

Jodie is a TVI from the UK working at a special school for blind and VI children. Jodie also works as a supporting TVI at mainstream schools where she visits different blind and VI children. She has been working in the educational field for around 25 years, starting as a mainstream teacher for sighted.

Nancy is a TVI from the UK working at a special school for blind and VI children. Nancy has worked for one year as a mainstream teacher, and now has more than ten years of experience working with children who are blind and VI.

Additional interviews were held in 2019 with other specialists within the field of blindness and Assistive Technology. In this study I include parts of an interview with two French braille consultants who have more than 30 years of experience combined, within the field of braille. Both have worked as supporting TVIs in mainstream schools in France.

6.1. Mainstream Schools – A Visual Normality

In the following I describe some "normalities" I have discovered within mainstream school settings. Initially I introduce how I use the terms normal and abnormal, before introducing the normalities of *visual norms* and *the social*.

Some of the educators steer away from the term "normal" whenever it regards their blind and VI students. Charlotte, a Danish teaching assistant, says that children can "feel more normal in *quotation marks*"¹⁰, as if she does not want to specify what "normal" means. When the educators do use this term, they seem self-conscious. However occasionally, they refer to "normal children" or a "normal class" without further hesitation. Within the official Danish educational system, terms such as "normal" is used frequently; children can attend a "normal class", participate in "ordinary" education, if their intellect is "normal". Normal children are within the normal field of education. Contrary to this we find the children with "special needs" who can attend a "special" class or go to a "special school"; this is the field of special education. (Undervisningsministeriet 2020) The "normal" is defined by the majority of children, or the average child, and these are *able* and intellectual, leading to a minority being described as having disabilities or special needs. "Normal" can be negative, positive or neutral depending on the context, and the educators e.g. say, "the majority of children" attending a "general" class, or go to an "average school". Although the educators at times avoid terms like "normal", they are comparing the children's behavior, abilities and needs to what the *majority* of children do and have. Anthropologist Ruth Benedict (1934) have argued that cultures have different understandings of the 'normal' and 'abnormal'. Although Benedict described dramatic differences such as murder and black magic in tribes, she argued that normality is; "[...] a term for the socially elaborated segment of human behavior in any culture; and abnormality, a term for the segment that that particular civilization does not use." (Benedict 1934, 73). From Benedict I adhere to the notion that normality and abnormality are defined *differently* in different (culturally defined) settings, however I do not debate moral relativism and what is considered "good" or "bad" (Benedict 1934). Therefore, I use the term normality as it is defined by what is to be expected by the majority within a setting, and abnormality as what is out of the ordinary

¹⁰ All quotes from Danish educators have been translated by me and will not be further marked.

within a setting. In the following, I focus on *vision*, and behaviors that are defined by a normality of having vision in a mainstream school setting.

Visual norms

Charlotte who works as a teaching assistant for a blind boy says: "I believe it is in their best interests when we tell them; "when you eat like that, it doesn't look very nice." Charlotte says that other people are staring when her blind student is not behaving like others, and she teaches him to eat "nicely" so he is not stared at. Some blind children do stereotypic rocking, a repetitive movement of the body, sometimes involuntary, that can vary in degree and type (McHugh and Lieberman 2019). Educators I have spoken to describe it as a way for the children to stimulate the brain, due to lack of visual stimuli. Charlotte's student does stereotypic rocking, and she says; "when you are in a gathering you will really stand out". She acknowledges her blind student's involuntary or need of stereotypic rocking, however she also wants him to feel like he fits in. A French TVI explains how she tell her blind students that; "you can do [stereotypic rocking] but not in public, or just be careful." She further says that "sometimes they don't do it on purpose they just don't realize that they are doing it." Stereotypic rocking is abnormal, sometimes inappropriate, behavior in a visually driven setting, and results in staring. Jodie who works as a TVI in the UK describes how one of her blind students is being taught to face sighted people and keep his head up, because that is "the way they know that you are interested in what they are talking about." She further recalls her student asking "Why? Why do I have to do that?". The TVI from France also explains: "A lot of blind children need to understand that they have to face someone to talk. But it is easier to do like that [*looks away from me*] but it's not socially acceptable." The educators try to teach their blind or VI students behavior, that is driven by visual clues. Jodie reflects on this saying: "If you ask (blind and VI children) whether they fully *understand that concept the answer would be no."* This behavior is part of a mainstream school setting where normalities are often driven by the majority, in this case sighted people. I call this behavior "visual norms" because they are often driven by, and experienced through, visual perception. Social norms can involve sensing when one's behavior is accepted or not accepted within a group, and to blind or VI children this can simply be hard to *do*. Further, and perhaps even more challenging, it can at times be impossible for blind or VI children to even grasp the *reasoning* behind these visual norms.

"The social"

Visual norms are closely related to social interaction, and Bodil tells me about a challenge for her VI student in mainstream school:

"[She] could not read the expression of others indicating "we don't want to do this anymore" [...] The rest of us can quickly grasp the fact that; "all right, maybe I should stop this" [...] But these things she couldn't see, you know? Some things happened where I had to teach her; "you should be aware of this.""

The VI girl does not see the facial expression of her peers, and Bodil thinks this is one of the biggest obstacles for the student in her interaction with others. Bodil believes this gets harder as the children grow older, because then *"you don't play the same way [...] it's more talk and facial expressions."* Anna who has worked as a TVI with multiple blind and VI children at Danish mainstream schools, describes this as a challenge for blind and VI people in general:

"To be blind, then you are kind of in your own little world. One of their huge challenges is the social because 75% of our communication is nonverbal; there is a lot going on in how you just wink or flirt, or you just point your thumb to the right, or pull your head back to say "i'm actually not interested in that", and they don't read that, they don't get the chance."

Pedagogical anthropologists Laura Gilliam and Eva Gulløv describe how mainstream educators in Danish schools regard "the social" as important skills to teach their (sighted) students, and that this involves educating civilized children. Part of "the social" is teaching students proper behavior and harmonic interaction with others, in order to: "[...] nurture a particular kind of fellow human being, a particular kind of interactional form and a particular kind of community." (Gilliam and Gulløv 2017a, 243) What I wish to focus on is, however, that this interacting with others, along with behaving "properly" in a mainstream school setting, is quite often evaluated through *sight*. These visual norms are determined, learned and expressed, through vision. For a blind or VI child, these norms do not necessarily make sense e.g. returning a smile, facing another person when talking, and "looking" appropriate. Educators from the UK, Germany and Denmark all refer to "the social" as challenging for blind and VI students. A mainstream school setting is determined largely by visual norms, because the majority of people in it, can see. This is also the case in broader society, which I return to in chapter 7. When a blind or VI child is interacting with their sighted peers, in a *visually driven setting*, their behavior can at times be observed as out of place, by educators who themselves are sighted.

6.1. A mainstream school setting is entangled with the term "normal", both officially in Denmark, and within the settings more broadly. The normalities are driven by the majority of sighted, and educators teach visual norms and "the social" which can be challenging for blind and VI children. The educators strive to provide blind and VI children with the same abilities as sighted children; the expectations of abilities are set from what is expected in a mainstream school; what is considered normal. The educational settings of mainstream schools are, in this study, defined by visual norms and the 'normal' is here defined as having visual perception. Because blind and VI children attend school together with sighted peers, their lack of vision can lead them to be out of the ordinary; their behavior is at times abnormal within the setting of a mainstream school.

6.2. Literacy Technologies in Mainstream Schools

Special literacy technologies are used by all educators' blind and VI students. A few educators suggest that because these technologies are different from what others use, the blind or VI students are reluctant to use them. Further, educators describe how their blind and VI students are dependent on digital technologies, which confuses the definition of independence as a normality. In the following I explore how literacy technologies take on roles as abnormal, while the same technologies are observed to increase the children's normality within a mainstream school setting.

Abnormal Technologies as Tools towards Normality

When I ask the Danish mainstream teacher Bodil what the biggest difference is between her student with a VI and the sighted classmates, she answers that in Design classes it was difficult for the VI girl because she had to bring her special lamp with her; "she found that quite annoying *that she had to bring this lamp*". Further, the student used A3 printed books with large print text, and did not want to use her iPad with magnifying software, although all her books could be digitally magnified on there. Only when writing assignments: "then she would do it because then the others would use a computer too – then she could see that; okay this is clever. But when *they* used books, she would use her giant books as well". In these examples, Bodil indicates that the motivation from the VI student stems from using similar literacy technologies as her classmates. She describes how the student did not like some literacy technologies, as part of "all the stuff on her table". In investigating this further, the medium of braille is a good comparison, because it essentially always stands out from what sighted students are doing. Some VI students who are still able to see large print, are encouraged to learn braille, either to make reading less exhausting for them, or to prepare them if they are continuously losing sight. This is the case within a study by Swedish researchers of special education; Kim de Verdier and Ulla Ek. In a Swedish mainstream school, they found that a VI student "[...] had learned to read print, and the motivation in the [VI] student for braille instruction diminished because the student wanted to read "like everyone else."" (Verdier and Ek 2014, 466) This student was evaluated to have benefits of learning braille; however the student did not want to read in a way that was considered abnormal. The researchers further found another VI student not wanting to read braille because the student, in his own words, wanted to read "normally". (Verdier and Ek 2014)

Another study by educational researcher Sue Rogers (2007), approached mainstream educators of VI children in the UK through questionnaires and phone interviews. Rogers concluded that:

"By far the largest percentage were pupils whose dominant medium was print [text] and within this group there appeared to be a high level of dissatisfaction and resistance to being involved in a learning route that was perceived as different from their peers. A pupil's emotional response to the need to learn braille is complex. This may be further complicated when the pupil feels part of both a culture and a social group of print users but is then potentially isolated as a braille user." (Rogers 2007, 129)

Rogers found that being part of a *culture* of print users *does* seem to affect these children's motivation to learn through alternative mediums. What Rogers calls a culture of print users is interesting; because the *literacy technologies* of e.g. print textbooks define this cultural practice. Rogers concluded that educators reported that VI students would prefer the visual mediums over auditory or tactile, because the visual mediums were not "different". (Rogers, 2007) It should be noted here, that these studies involve VI children who still have some sight left for reading print text, which gives them the *choice* between print and braille. VI students of Bodil and Diana, who also had this choice, did not want to use audiobooks at first, but the educators kept encouraged these mediums. Charlotte's blind student do *not* have this choice, and because he cannot read braille fluently, he is listening to audiobooks when the sighted children in his class are reading text.

The setting of people who use visual literacy technologies such as computers, books and print text in general, becomes a set of *culturally defined normalities* (Benedict 1934). There is a dominating understanding of what literacy is; text, that should be read through visual mediums. In continuation of this, Jodie who visits blind students in mainstream schools in the UK mentions that "*If you're the only 15-year-old in a school who is blind and using braille – that in it of itself is socially isolating.*" She further reflects on how sighted children might experience braille: "*The [blind] children learn this mysterious thing called braille that looks so difficult on paper.*" Braille can look abnormal to sighted people and is designed for *tactile* perception, so for a blind braille reader it might be words and stories. For a blind child a braille book can thus represent an experience, whereas to sighted people it can represent something unfamiliar or

odd. However, because the blind or VI child, with the braille book, is placed within a setting where the majority are sighted people, this might have an effect on the blind or VI children's own understanding of what the braille-book *is*; something abnormal. Further, because the blind or VI children can use a braille-book with a shared intentionality, this can lead to an abnormal; *child-with-braille-book*. Some blind and VI children *are* found in some cases to be influenced by the fact that their literacy technologies are *different* in settings with sighted peers, as Bodil suggests. Literacy technologies for blind and VI children are however not always being observed as abnormal, they are also observed by the educators as serving the opposite purpose; increasing a student's perceptual range *towards* what is considered normal.

Diana, a mainstream teacher, explains how her VI student used a CCTV; both in order to read paper that was handed out, but also to see what was written on the board. Diana observed the VI student to use the CCTV as a *tool* that expanded her perception and made her able to have a more 'normal' experience, similar to her peers. Thus, to the blind or VI student it served as a crucial tool for her ability to see closer to what others see. I ask Diana whether there were any challenges regarding the CCTV, and she pointed out that she found it odd that no one could borrow the CCTV from the VI student. Diana considered the CCTV as beneficial in subjects such as biology for the sighted class to look at smaller insects, however this was not okay with the VI student; *"it was hers"*. How come? To sighted people, a CCTV can provide visual perception *beyond* the normal, and it gives the ability to see *more* than what others can see. The CCTV can thus provide vision *out of the ordinary* to people who are already sighted, while providing closer to normal vision for the VI student. One possible explanation to why the others could not borrow it, could be that sighted people can, through the CCTV, *increase* the gap between their abilities and the VI student's abilities. The VI student is dependent on this technology, whereas sighted people are not.

Bodil explains how her VI student, who did not like all *"the stuff on her table"*, also used a dome magnifier, a small glass tool, to enlarge printed text. Bodil explained how the dome magnifier was the student's preferred tool. This made the student able to read Harry Potter, and other fantasy books. This way *"she could still use the same books as the others."* According to Bodil, the fact that the dome magnifier allowed the student to read the same books as her peers, was a key part of her motivation. Bodil mentions that the student also used A3 printed books in the beginning with large print, and this way *"she had the exact same books as the others – just*

enlarged." How can Bodil observe the VI student both like and dislike the special literacy technologies? From the eye of the observer – in this case a sighted mainstream teacher – literacy technologies for blind and VI children can stand out as artifacts that look abnormal. A lamp that needs to be moved from one place to another is an object in the world that one can perceive, however when the lamp is placed and it provides light, it is used as a *tool* by the VI student so she can see *closer to normal*. Bodil observes that the student uses literacy technologies as *tools*, like the dome magnifier that allows the student to read the same books as the majority (normal books), so here the dome magnifier serves the student in what Ihde calls an *embodied* relation. The technologies can *expand the student's perception*, so she can perceive closer to what is considered normal; similar to Merleau-Ponty's analysis of a blind man-with-cane, which makes him able to perceive and orientate in the world (Merleau-Ponty [1945] 2012, 127). Don Ihde argues that humans have a dual wish; for technologies to *serve us*, however that we simultaneously would like to be freed from the technological mediation:

"In the wish there remains the contradiction: the user both wants and does not want the technology. The user wants what the technology gives but does not want the limits, the transformations that a technologically extended body implies. There is a fundamental ambivalence toward the very human creation of our own earthly tools." (Ihde 1990, 76)

This contradiction might be what Bodil observe from her VI student, and the literacy technologies take on dual roles of being wanted and unwanted. These literacy technologies can increase *normality* while they are *"transforming"* the child's *"technologically extended body"* towards the abnormal.

Independent Skills through Technologies

The educators teach their students in mainstream schools to do things by themselves. In the following I unfold what the Danish educators in mainstream schools seems to regard as "independence", within the notion of visual normality in a mainstream school setting. I explore how they view the role of literacy technologies as both providing independence while being something blind and VI children are dependent on.

Charlotte teaches her blind student to walk the halls, go to the bathroom and socialize in breaks without external help. Charlotte explains how *"it has been really difficult for him to walk with his*

blind cane alone", however she stresses the importance of adults being able to "pull back" so the boy can learn to do things by himself. A VI girl who is about to start school needs to visit the school several times before she starts, so that Anna, her TVI, can train the layout of hallways, bathrooms and classroom with her. Bodil explains how her student had been taught to keep her things organized by herself, and this meant something to the student's sighted classmates; "I think that meant something to the others as well, that they actually felt that [the VI student] didn't need a lot of help with these things." Attending leisure activities is described by Anna, a Danish TVI, as something blind and VI children have the *right* to attend *alone*, without family, just "*like* their siblings do." Overall, the ability to do things without help from others is by the Danish educators being considered normal and important. The educators seem to strive to teach their students *independence*. Gilliam and Gulløv describe independence as an institutional goal for educators in Danish mainstream schools. They argue that independence is considered part of a larger ideal of children being able to act freely, to a degree; however the authors do not define this independence, but relate it to the children being autonomous (Gilliam and Gulløv 2017a, 242-243). What independence is becomes unclear, when Danish educators in this study gives examples. Assistive Technologies can, like with literacy technologies, have a beneficial role in relation to achieve these normal skills. A talking GPS, a blind cane or a phone can allow extended perceptions of the surroundings and the ability to walk without help. Similarly, Bodil describes how she has observed her VI student "compensating" for her visual impairment, using a smartphone:

"I could suddenly see that she had found this new strategy where she took pictures of things. A lot of things and then I could see that when she was alone, she would zoom in on those pictures. Because when the others [sighted classmates] were pointing and saying "look!" then she couldn't see it, she just pretended she could see it, and then afterwards she would see that "oh there was a hare" or whatever."

Bodil observes this situation as the student's way of trying to fit in with her sighted peers, by pretending to see what they see. The student does not ask her peers what they are looking at; instead the student finds out by herself, away from the others, with the help of her phone. Similar to the dome magnifier, the CCTV and the lamp, the phone is observed to allow the student to expand her perception in order to be independently able to see the hare, similar to the normal experience of her sighted peers. Independence seems to be defined by the Danish

educators as; if others can do something without help, blind or VI students have the *right* to do the same *without help from others*. Disability Rights UK, a large charity, writes that independent *living* should be a right for people with disabilities. One of their aims towards independence is that people with disabilities should have access to *personal assistance*. (Disability Rights UK 2014) This stands opposite to what Danish educators strive for, and the question becomes: can a person be independent *through* getting help from others? Researchers within independent living for people with disabilities have used the term "interdependence" to describe this dual understanding:

"Interdependence means individuals determine the extent and time they want to rely on others and when they prefer to do things themselves. It is a blend of independence and dependence that individuals attempt to attain." (Budde and Bachelder 1986, 241)

This might be what Danish educators strive for; if the blind or VI children are *able* to do things by themselves, they will have the choice in the future. This is however unclear, and literacy technologies seem to be of importance as well. The Danish educators also link their understanding of independence to the ability to read and write, both for blind, VI, and sighted people. Bodil who has taught the subject of Danish in mainstream schools for more than 30 years describes the joy sighted children express from learning to read; "Yes, I can read a book by myself!". Bodil says that this "does something to them." Diana, who now works as a reading consultant, reflects on the ability to read and write for sighted children with dyslexia and calls it a *powerful* skill; to *not be dependent* on getting texts read to you. According to Diana this skill plays a role in how "free" children are, and it matters because it provides independence and the fact that: "no one should decide what one can and cannot do". Here, independence is seemingly regarded as the ability to be able to read and write with no help from others. Educators have the same reflections in relation to their blind and VI students' abilities to read and write, whether through large print or the alternative medium of braille. Anna teaches a young VI girl to read braille because "what the other [sighted children] learn, she should learn too.", and Charlotte who teaches the blind boy tells me that "it doesn't really matter whether you read with your eyes or your fingers. But I think it is super important to teach! Super important!". The Danish educators generally suggest that reading and writing is important, and that it makes all children independent from other people, because they can understand and produce words by themselves, similar to the ability to move around and do what sighted can do, without assistance.

Digital technologies such as text-to-speech and speech-to-text software, and audiobooks, can be used both by sighted and blind. I challenge the Danish educators by asking them why anyone, including sighted, should learn to *read* and *write* in 2020, when literacy activities can happen through these digital alternatives. Charlotte clearly expresses that the ability to read and write is important, however she struggles to argue *why* when digital technologies can substitute. She says that it would be "weird" not to have this ability, and debates with herself during the interview. She reaches the conclusion that people *could* get by without the ability to read and write, however that: "I think we as humans still want the ability to do some things for ourselves without being 100% dependent on IT". Charlotte considers reading and writing as a form of independence, but here it relates to not being dependent on digital *technologies*, rather than other *people*. Diana says that people should learn to read and write, because it is a cultural tradition that works, referring to the fact that people have done this long before digital tools came along. Bodil believes it is a valuable skill in order to immerse into a story by creating words inside one's head rather than listening through digital technologies such as an audiobook. The Danish educators mostly express that being dependent on *digital* technologies is not ideal, and therefore children should learn to read and write independently.

None of them refers to books, paper and pens as technologies sighted people are *dependent* on per se, so they seem to have an understanding that *digital* technologies in particular, are something one should not become too dependent on. However, as previously demonstrated, reading and writing for blind and VI people is often *rooted* in digital technologies, with CCTVs, magnifying software and text-to-speech. As Anna says of the young VI girl who is about to start school: *"this digital world, she is also very dependent on, e.g. audiobooks and all sorts of programs."* Anything from braille notetakers to magnifying software are considered by the educators to be useful digital tools for these children in order for them to become *literate*, and even the experience of a story through audiobooks are described by educators as further supporting their students' ability to read and write. What independence *is* to educators varies, however overall, they seemingly regard independence as not being (too) dependent on other people and technology, this seems to go against the Danish educators' "ideal" of what an independent child should be, in some cases.

6.2. In a mainstream school setting, where the normal abilities are often determined through vision, literacy technologies used by blind and visually impaired children take on different roles. Educators observe their students to dislike their special technologies, because they are abnormal from what their sighted peers are using. A culture of visually defined normalities exists, where braille, CCTV's and audiobooks are abnormal literacy technologies. In an embodied relation between child and technology, the child-with-technology can be considered an abnormality. The educators however also observe how their blind and VI students use these technologies as tools to gain abilities that are closer to the normal abilities of their sighted peers. Some technologies allow the blind and VI students to be more independent; something educators regard as an important normal ability. Educators strive for an ideal where their students are not dependent on other people, and digital technologies. This is however challenging when blind and VI students are often dependent on other people and digital technologies. From these examples, I argue that literacy technologies have contradictory roles for blind and VI children in mainstream schools; they are on the one hand increasing what educators consider *normality*, while on the other hand being observed as restricting this ideal and make the children more abnormal. Thus, the abnormal technologies can increase blind and VI children's abnormality and normality, while the dependence on technologies can both increase and limit overall *independence*.

6.3. Blind Settings - A Different Normality

I have described how blind and VI children are taught visual norms, and that "the social" can be challenging in mainstream school settings. These settings are defined by a visual normality and educators strive to teach blind and VI students the same normal abilities as sighted children have. So what happens when blind and VI children are in settings that are less driven by visual norms and visual interaction? Where special literacy technologies are used by their peers as well? Where their abilities can be compared to others who have similar conditions of life as themselves? These settings are special schools for blind and VI children both in the UK, where Nancy and Jodie work, and in Germany where Mia works. A similar setting is also found in Denmark at Computer Camp where I did ethnographic fieldwork. In the following I explore what normality is within these settings, and which roles literacy technologies have in these settings.

At Computer Camp I sit next to a small blind boy, who is playing with the LEGO bricks with braille on them:

His right hand moves away from the bricks and over to my arm resting on the table. He grabs my arm very lightly, says "Ida!", flips his hand and strokes my arm with the back of his hand. He is not speaking as he pats my arm, but I sense that it is a hug – an acceptance of my presence. [...] His hand stops by my bracelet, and I ask him if he can feel my bracelet. He thinks silently before saying; "Where did you get this bracelet from, Ida?". I tell him that I have inherited it. [...] He feels the bracelet again, pats my arm very trustingly, and returns to the bricks.

Fieldnote 10/10/2019

This boy perceives me and my bracelet, and our interaction is defined by touch and sound. This is Computer Camp, where blind and VI children run around, knock over stuff and bump into furniture. They do stereotypic rocking during dinner and seemingly have the time of their lives. As I play a magnified version of the UNO card game with a VI boy, he tells me that he is the only boy at his school who "sees badly" and the other children see "quite well". When I ask what he

thinks of Computer Camp he looks at me and says that he really likes being with other children that are "like him". Computer Camp is unique because it is defined by different perceptual interaction, norms and activities as all the children here are blind or VI. Visual norms and being abnormal from peers, seem far away during these two days, and the children have a unique bond with each other. Similarly, Jodie talks about the special school she works at in the UK;

"The setting is tailored and conditioned to support the learning of these [blind and VI] children, and they develop skills that then can be transferred into mainstream society, when they have learned them in a supportive environment."

When Jodie talks about her special school, she defines it as a supportive environment separate from "mainstream society". The special school is tailored to blind and VI children, and here they can learn distanced, but not isolated, from the rest of the world, before they transfer their skills when they leave school. Researchers interviewed blind adults from the US who had attended both mainstream school and special school. They concluded that the adults had felt more "normal" at the special school, because their peers had the same challenges as themselves (Haegele et al. 2017, 141). Similarly, other researchers interviewed a Swedish VI student who transferred from mainstream to a special school for blind and VI children, and found that the student was very happy, saying *"this school is for kids just like me!"* (Verdier and Ek 2014, 465). I ask Mia, a blind TVI who works at a special school in Germany, what she thinks of a *mainstream* school setting for blind and VI children:

"Well that's a difficult one. I actually don't have one answer. I think in general it's a good idea. However I think a lot of things get lost in this process. For example, the most important thing is the peer aspect. If I'm a blind kid in a blind school, and I see that my colleague can already go to the playground by himself, then I would say "oh my god, he can use a cane, he can go to the playground, I can do this too!" or "he can already close his jacket or write his name" or whatever. So we can play hide and seek together because we are both blind. But in a regular [mainstream] school; I am the only blind so I cannot compare. Okay the sighted kids can go to the playground but that's because they can see. So, I can't go to the playground, I need someone to take me there. So it's a lot the social aspect which is a problem." Mia expresses the importance of the children being able to compare themselves to children that have the same challenges as themselves. She also connects this with "the social", which she believes is the most challenging at mainstream schools. At *special* schools, the level of abilities the children need to learn can be understood in the context of visual impairment, which Mia thinks increases the children's motivation, and their abilities to play with each other using similar perceptions. The children at special schools are still being taught visual norms, and behavior for "the social" such as facing another person. However, at Computer Camp I saw how the interaction with their peers was *not* dependent on these norms. This is presumably similar in a special school. Jodie explains how the children learn both academic and social skills:

"I think that if you can learn in an environment where those support needs are just second nature to the people working in that environment, then your learning is going to be easier. Whereas trying to learn in an environment where people don't really understand your disability it can be harder."

The support needs of blind and VI children include anything from an adult assisting them, to learning how to use literacy technologies. These needs are well known to the TVIs, but also to the children. At Computer Camp and special schools, the children here are blind or VI, and they are the *majority* in these settings. This flips the notion of what is 'normal', and thus these settings are defined by something very different than mainstream schools. Ruth Benedict's argument of a normality being culturally defined becomes clearer in these settings. Benedict writes; *"The most spectacular illustrations of the extent to which normality may be culturally defined are those cultures where an abnormality of our culture is the cornerstone of their social structure."* (Benedict 1934, 78). Again; Benedict's *examples* are not directly comparable to this study. What I suggest is that having a visual impairment is an abnormality within mainstream schools *and also* in "our" visually driven culture more broadly. This abnormality is however the "cornerstone" of the structures at special schools and Computer Camp.

Blind world or blind settings?

In a Danish study by Senior researcher of disabilities Steen Bengtsson and then research assistants Nuri Cayuelas Mateu and Anders Høst (2010), they interviewed blind children with the aim of researching their wellbeing and conditions. They concluded that the blind children

interviewed want to live in "the world that sighted people live in" ¹¹ and that they "do not want to live in a blind world, like many blind adults do, in their experience". (Bengtsson, Mateu, and Høst 2010, 15-16) Through the years, I have talked to many blind and VI adults, and the expression "blind world" has come up frequently. At Computer Camp, they talked about the "blind world" being small in Denmark, and that they all knew each other. However, this notion of the "blind world" is not clear, because it essentially stands in contrast to the "sighted world" which I suggest *is* the way humans have created norms, practices and technologies in general. Bengtsson, Mateu, and Høst (2010) further conclude that these blind children should work hard *"if they really should get into the common world"*. (, 11). The notion of a common, or what I call sighted world, is present here, however the study concludes that the blind children are not being prepared sufficiently for life in a common world, and therefore the children risk to end up in a "blind world" when they become adults. The authors do not define these worlds; however, I take exception to their notion that these children *either* become part of a blind world or a sighted world. I suggest that blind and VI children are *always* in a sighted world; a world that is constituted by visual norms, practices, technologies, and standardization that fits the majority; sighted people. In this study, I rather demonstrate that blind and VI children can be in environments, situations or settings with other blind or VI children, shaped or designed to accommodate their non-visual perception. Special schools and Computer Camp I will call blind settings, however they are placed within a sighted world, and they are created by mostly sighted educators who intend to teach these children to live in a sighted world when they leave. At Computer Camp I experienced, what I would describe as a break for these children, from being abnormal in a mainstream school. The settings are temporary because the children need to venture out into a sighted world after school, or when the camp ends. The terminology used by various blind and VI children and adults might be related to the *perceived* world as 'different' from a world that is visually driven more broadly. This I define more explicitly in relation to phenomenology, in subchapter 7.4.

¹¹ Translated by me

6.3. Blind settings of Computer Camp and special schools for blind and VI children have a different normality. The children at these settings are all blind or VI, and they interact, behave and relate to each other, in a way that is not based in visually driven normalities. The normal child is here a child with a visual impairment. The TVIs who work there are trained to accommodate the needs of these children, and although they still teach their students visual norms, the setting is tailored to practice this where others understand. Visual impairment can be considered an abnormality in a sighted world; however it is the cornerstone within these blind settings. Here, a normality that is determined by the majority, who are blind or VI, is not driven by visual perception.

6.4. Literacy Technologies in Blind Settings

Blind settings have a different normality than in mainstream school settings. This makes the literacy technologies have different roles, as I observe them to facilitate experiences, inspire and connect blind and VI children. Further literacy technologies are described by TVIs at special schools, as being unique to each student, creating a setting where individuality and uniqueness is supported, and where the 'ideals' of the "normal child" are quite different to those found in mainstream school settings.

Computer Camp - Being like Others and Being Inspired

A fieldnote from Computer Camp:

Tim, [a blind boy] comes over and sits next to Peter [a young blind man]. Peter has made his Polaris [braille notetaker] make sounds, and Tim finds it very funny. He is laughing a lot, and the two are having a blast. Peter is instructing Tim, saying stuff like "yes, and then up in the menu, and then two down" and "oh, let's exit this site". I watch them intensely, and I have no visual clues of what they are doing. [The notetaker] has an interface in one-line braille, and their fingers are constantly working there, as they use buttons to "scroll" and read the next feature or text-piece. They have a clear understanding, even though they do not touch it at the same time. It is seemingly invisible how they do this, and I will never understand. [...] Suddenly, Tim yells "Peter is the best! He is the BEST teacher!". I smile, as this goes to show Tim's excitement, and the connection between the two.

Fieldnote 10/10/2019

This fieldnote from Computer Camp exemplifies several things; it proves how I, as a sighted person with no technical or tactile knowledge of a Polaris notetaker, am struggling to understand what the two are actually doing on the device, that has no visual interface. Further it shows how Tim as a young blind boy is experiencing teaching from "the best" teacher, who has a similar understanding, and perception, as himself. Lastly, and in continuation of the latter, the fieldnote illustrates how these two have a unique connection that is expressed through their

use of a braille notetaker. The braille notetaker is used as a tool, however seemingly not in order to achieve similar "normal" abilities as sighed children. I rather interpret Tim and Peter as having a unique experience together, *of* this tactile literacy technology. Tim is completely focused on the notetaker, and what Peter is doing with it; they are sharing a tactile and auditory medium where there is no interference from sighted people. The TVIs at the camp tell me that there is no plan for what the children need to learn; instead the camp provides what they call "hidden learning". Most of the adults at the camp are sighted, and as I myself visually observe these children, the matter of their learning being "hidden" holds very true. *This* is what I consider Merleau-Ponty ([1945] 2012) means when he writes that the world of a blind man is different of that of a sighted; Tim and Peter are having an experience that neither I, nor any other sighted, would be able to have or participate in. The technology itself is not made for my abilities; I tried a braille notetaker myself at the camp, and noted the following:

The larger one had no visual display as it was only braille cells. [...] As I do not read braille I had to decode it by using my eyes. After 10 minutes of struggling I managed to read the word "information".

Fieldnote 10/10/2019

Not only am I slow, I am also decoding braille using *vision*, which is completely different from what Tim and Peter are doing. Two French braille consultants who have made international research, tell me that they do not know of any sighted educator, even TVIs at special schools, who can read braille using their hands. They all use their vision. The perception is different, even for the educators who are trained to teach this *tactile* medium. Mia, a German TVI who is blind and fluent in braille herself, tells me that they do not use braille notetakers at her special school partly: *"because the sighted teacher cannot look at the screen [and see] what the blind student is doing, because it usually doesn't have a separate screen. [Notetakers] are difficult, really, for sighted teachers."* Even braille notetakers specially made for tactile perception can become an obstacle to teach with, when the majority of educators in general, are *sighted*. Tim is learning from someone who is blind *like himself*, and he can take inspiration from Peter's tactile skills as to what is possible for himself.

The next day during a break, I see Tim sitting with a young boy around his own age:

I see Jonathan and Tim [both blind] sitting and laughing loudly with no adults around them. Tim is clapping his hands, and screaming of laughter, while Jonathan is goofing around – all while they are sitting with their Polaris [notetakers]. [A TVI] points to them, and tells me "see that? THAT right there we cannot buy our way to!"

Fieldnote 11/10/2019

Tim and Jonathan are sitting together and they each have their Polaris braille notetaker. Although they are using their Polaris for individual things, they are somehow sharing this experience. What seems to be two individual tactile practices are somehow becoming one. From my visual perception of this, it seems unlikely that they know what the other is actually doing, but this does not seem to matter at all to them. What seems to matter is that the two have similar tactile devices, perceive the same tactile medium of braille and that neither of them depends on visual interaction. A situation that would not have been possible in a mainstream school when their peers are all sighted, and use different technologies. The laughter, clapping and "goofing around" is an understatement of the joy these children expressed. Although I have not seen these children in other settings than at the camp, the boys' teaching assistants were clearly expressing that this was something out of the ordinary. The literacy technologies were front and center at this camp, and this was not because the adults made it so. During the breaks, the adults would get coffee, while the children would stay with their Polaris', which was the case of Tim and Jonathan.

In another room, VI children were working with different devices such as CCTVs. Bodil who is a mainstream teacher mentions that her VI student has been to Computer Camp many times and that this was beneficial in terms of the student's acceptance of special literacy technologies:

"They would learn about all these technical devices that could help. And precisely because she did not like [those devices] it was really good to send her off to these camps. You could say "all right, this lamp you saw when you were [at Computer Camp!]" and that could help a little" Bodil believes her student benefits from these camps. This might be because the student meet others with a visual impairment who uses these devices, in a setting where the technologies are considered *normal*. The setting can change the understanding of what the technologies are, as Don Ihde describes multistability: *"the 'same' technology in another cultural context becomes quite a 'different' technology."* (Ihde 1990, 144) Thus, Computer Camp acts as a facilitating setting where special literacy technologies can be explored, together with peers who also use these. Charlotte who is a teaching assistant for a blind boy also reflects on Computer Camp:

"I think it's a really really good idea! For the student being social, together with others who have the same challenges, but also, as a plus, for us educators who have blind students. [...] I have often thought "wow! Can they do that? We need to go home and practice that skill!" and then suddenly he is able to do that. [I would] have thought that "oh well, he probably can't do that because he is blind". And then you just see others run around doing that and I think; that is really inspiring!"

Charlotte is inspired and sets expectations for her student, in part from comparing what she has seen is possible for other blind children at Computer Camp. This is also the case regarding literacy, and seeing what is *not* possible for her student: *"we practiced the [braille notetaker] every day, [but] the thing where normal blind learn to read from left to right and have that fluency, he would not be able to do that."* Charlotte has observed other blind students at blind settings, and because many of them can read braille fluently, she calls them "normal blind". Normal abilities *of blind* children Charlotte finds useful, because these skills are shaped around their *perceptual abilities* and special literacy technologies. However, Charlotte's students have some learning difficulties and can therefore not read braille like the "normal blind". The blind and VI children at Computer Camp have similar conditions, or starting points, for their learning, and this allows them and their educators, to compare; although the children are still individuals.

At Computer Camp the literacy technologies take on roles of facilitating joyful experiences for the children there. The children share their unique perceptual understanding of literacy technologies in a setting where these children-with-technologies are considered normal. Further, literacy technologies at the camp represent the abilities and *possibilities* for children who have a visual impairment, because the children can share the perceptual abilities *meant* for these technologies. The technologies are, in these moments of use, not taking on the role of increasing normal abilities that sighted children have. Instead, the technologies have a role of increasing normal abilities that *other blind or VI children* have in this blind setting. This is described as inspiring and motivational to both children and educators.

Special Schools – Unique Literacy Technologies as a Normality

Nancy is a TVI from the UK, and she works at a special school for blind and VI children. She says:

"But I guess how it differs from a mainstream school is.. I would like.. very much adapt things to the pupil and what their preference.. you know.. their individual sort of likes and dislikes. I am quite often making up new resources to suit that particular pupil."

In a mainstream school, the same teaching materials can be used for most sighted students, and the teacher can direct a whole class in the same activity. Nancy believes that because she adapts material specifically to her students in terms of their needs, this makes the special school different from mainstream. Jodie who also works at a special school in the UK, has similar reflections on adapting materials, to make them accessible for a blind or VI learner:

"Within specialist subjects there is very little in the curriculum sources that are designed for blind and visually impaired children to use. So you have to find a traditional curriculum resource and you have to think; "okay how am I going to make this accessible for a blind and visually impaired learner?" [...] And if you think about a young child's mathematics book they bring home from school, it is filled with pictures, and so much more information than just the math [...] And so, it is about reducing that complexity and giving them that information they need. We are often replacing the picture with three-dimensional objects to give meaning to what it is you are trying to teach them."

Because teaching materials are often made to accommodate sighted children, the TVIs spend much of their time adapting these, not only to fit the preference of their student, but also to be accessible in a medium that the children can perceive. Mia who works at a special school in Germany also brings up the issues with pictures in teaching material:

"In an English book you would have a picture and have the task; "look at the picture and say what the people are doing". Very nice! [*heavily sarcastic*]. And so, we have to describe the picture, try not to give the answer to the question. So this is all the preparation we have to do for the materials that we use. And then of course we have the children who can use the pictures, so they have to use the pictures, and the others will have to use the alternative text."

Mia is blind herself, so she has an assistant that helps her adapt some materials. She expresses frustration that teaching materials are often visual, and therefore non-accessible to her students and herself, however she knows that some VI students who are partially sighted, can still benefit from the pictures. Therefore, she uses many different materials specifically adapted for each individual student; *"They have to learn all the same. [...] but one use it in braille the other has some picture to it"*. She reflects on the different mediums she uses:

"We have the normal print book for children who have a light visual impairment. We have the magnified version, like letters size 16 or 22 for children with low vision. And we have it in braille, and for the older children we start having it also as a digital copy to use it on the computer."

These literacy technologies with different mediums are some of "the different materials we would use to make it happen. But the results would be the same, so after 10th grade they have to do the end of school exam, like the thing sighted kids do." Mia is describing a different road with different materials towards the same goal. This is interesting, because the normality is situated in this practice. At a special school, each individual student needs a *unique* tool to reach a specific goal. Part of the adaption includes changing the medium, such as changing an image to a tactile object that represent what the child should learn. Both Nancy, Jodie and Mia are changing materials, partly because these need to be *accessible* to blind and VI students, but also they are adapted to the specific *preference* of the student. Jodie reflects on what it means to be a TVI at a special school and says; "Part of what we do really well is we think on our feet and adapt the curriculum to suit the individual." Nancy have a similar understanding of her profession: "I think you become a bit of a jack of all trades when you become a teacher for the visually impaired [TVI] because sometimes a resource just doesn't exist, so you have to make something that would work for the pupil."

As previously described, these special schools still prepare the students for a life in a sighted world, by teaching visual norms and striving to teach abilities that resembles what sighted children learn. What is different is that the setting is not *driven* by visual norms, and the *road* to achieve abilities is unique to each student. Literacy technologies, whether it being English

print books, CCTV's or mediums such as text-to-speech software or braille, are being used to approach the needs of each student. The literacy technologies are as unique as the children themselves, and in blind settings this is the normal way to gain literacy as an independent skill. As Nancy says; "We use quite a lot of technology in English. So we use JAWS which is a screen reading [text-to-speech] software. And that allows the young people to access the internet and to navigate the screen independently." Independence is here rooted in special literacy technologies. Jodie distinguish between what she calls "support needs" and "developmental needs" for blind and VI children. She says: "You won't be able to drive your own car, but we can learn how to take a bus, we can learn how to call a cabby, and things like that." Independence seems to be related more to what Budde and Bachelder (1986) called *interdependence*; where the children learn that they can become independent by choosing support from other people, *and* by learning to do things themselves with digital technologies. In special schools the literacy technologies are not considered abnormal, odd-looking and different from what the majority are using. Rather they are simply technologies for literacy activities. The *dependence* on these different literacy technologies does not seem any more noticeable to the TVIs, than sighted people being dependent on books or the lamp in the ceiling, in order to read and write. The technologies are not present as mysterious abnormal objects in the world, they are simply useful tools to do independent literacy activities within this setting. With the TVIs' acknowledgement that all students in special schools have different needs and preferences, literacy technologies take on the role of being unique tools to obtain literacy as an independent skill, and the *uniqueness* of them is here considered normal.

6.4. Literacy technologies in blind settings have different mediating roles than they do in mainstream school settings. The children at Computer Camp can share an experience with or towards a technology that they perceive the same; something sighted people cannot be part of. The children expressed a mutual understanding, and careless joy of being with others like them, and the educators regard it as inspirational and motivational for both children and educators. The abilities, and expectations, are anchored in other children who have a visual impairment, and from this, a new normal is defined. At special schools, TVIs adapt materials to suit the preference and abilities of their individual students. No special literacy technology is considered abnormal, because the uniqueness of each individual, is one cornerstone of normality. There are different roads towards preparing these children for a sighed world, where they can be in(ter)dependent and have their own normal abilities. At these blind settings the normal is **not** based in visual mediums, norms and interaction. With this, the *uniqueness* of literacy technologies becomes a normality.

7. Technologies in Education and the Standardized World

In this chapter I intend to explore "inclusive education" more broadly, and how mainstream educators work within a setting that I suggest is standardized towards a majority, rather than individuality. This standardization I describe as a *worldly normality* in terms of how humans design settings, environments and technologies, in general. Following this, I describe what I regard as important in relation to some arguments made, and how I believe we can learn a great deal about individual perception and the world; through understanding education of blind and VI children, in what I have called "blind settings".

7.1. Inclusive Education and Terminology

The Danish educational system is generally divided into two areas; the "normal" and the "special". To be coherent with international literature, I refer to these areas as mainstream education and special education. The shift towards incorporating children with special needs and disabilities within mainstream education, can be referred to as "inclusive education" (Ajuwon et al. 2015, 134) Diving into the terminology, "inclusion" becomes challenging to define. Politicians, educators and psychologists all use this term differently in specific contexts, and there seem to be no general agreement on what *inclusion means*. In order for me to discuss inclusion, "inclusive education" and what this entails, it is necessary to specify some terms in relation to this. The United Nations Committee on the Rights of Persons with Disabilities; *inclusion, exclusion, integration* and *segregation*. I wish to remind the reader that these terms are used radically different, sometimes *opposite*, in Danish and foreign debates regarding immigrants, politics, social equality etc. which makes it necessary to define them in relation to *education*.

- *"Exclusion* occurs when students are directly or indirectly prevented from or denied access to education in any form.
- **Segregation** occurs when the education of students with disabilities is provided in separate environments designed or used to respond to a particular or various impairments, in isolation from students without disabilities.
- **Integration** is a process of placing persons with disabilities in existing mainstream educational institutions, as long as the former can adjust to the standardized requirements of such institutions.
- **Inclusion** involves a process of systemic reform embodying changes and modifications in content, teaching methods, approaches, structures and strategies in education to overcome barriers with a vision serving to provide all students of the relevant age range with an equitable and participatory learning experience and environment that best corresponds to their requirements and preferences."

(United Nations Committee on the Rights of Persons with Disabilities 2016, 4)

I use this terminology as an underlying basis for my further discussion, unless I 'mark' terms as used by others. The Danish Ministry of Children and Education describes the goal of "inclusion" in Danish mainstream schools as such:

"The goal of inclusion is to retain the students in the child-community, so that children with special needs are not separated towards special education, but are educated in the mainstream class with the necessary support and resources."¹² (Undervisningsministeriet 2020)

Children with special needs also involves children that have "practical difficulties" (Undervisningsministeriet 2020) e.g. blind and VI children, with or without additional disabilities. The Ministry regards the goal of "inclusion" as; children being placed within mainstream education rather than special, *and* that they are supported well in mainstream education. Within the terminology defined by the CRPD, the goal is thus: inclusion *after integration.* "Inclusive education" in Denmark thus aims for integration first, before it can be

¹² Translated by me.

regarded as inclusion. Integration can be said to be the practical act based on politics or policies, followed by the goal of inclusion, which is the actual *practice* to facilitate. The latter is left with the Danish educators at the mainstream schools. Charlotte's blind student, who attends a special class *within* a mainstream school, is determined as *segregation*, not integration. However, throughout this study I have separated between mainstream school *settings* and special *blind settings*. Charlotte's student is within a mainstream school setting, where *vision* is considered normal, which is still the case in the special class.

The CRPD defines inclusion as changing practices, approaches and environments, so they are fitted to *all students*' needs, learning experiences and preferences. This is how I regard the TVIs' described practices in special schools for blind and VI children, and it is what I have experienced at Computer Camp. Settings where teaching materials are adapted to suit each individual student in relation to their needs and likings, and students that have participating experiences. Inclusion is a practical task that educators need to perform in *any given setting*; it is not something that always needs to follow integration. With this, I regard the special schools and Computer Camp settings as the very definition of *inclusion*¹³. However, these settings are also representing the educational *segregation* where children with disabilities are educated in separate settings from children that do not have disabilities. Although the two-day Computer Camp is not officially regarded as segregation, it represents what segregation *could* mean to these children. The term segregation might have negative connotations to some, however as I will argue; inclusion *can happen* within segregation, and integration can also involve exclusion. As the CRPD writes:

"Placing students with disabilities within mainstream classes without accompanying structural changes to, for example, organisation, curriculum and teaching and learning strategies, does not constitute inclusion. Furthermore, integration does not automatically guarantee the transition from segregation to inclusion." (United Nations Committee on the Rights of Persons with Disabilities 2016, 4)

"Inclusion" within the Danish policy of "inclusive education", is *always* related to integration which makes it challenging for researchers like myself to discuss what I consider inclusion in

¹³ Note that this is not relating to whether the individual *students* are *included* (verb).

practices and *settings*. The term inclusion needs to be separated from integration; this term needs to be considered outside of mainstream schools as well.

7.2. Inclusion and Adaption of Technologies and Practices

In the analysis I have argued that literacy technologies for blind and VI children can take on different roles. In a mainstream school setting, where normality is visually driven, educators observe literacy technologies as increasing the blind or VI student's abilities towards the normal, while decreasing this normality, or go against the educators' ideals of what a normal child should be able to do. In the following, I approach more than literacy technologies, by arguing that the physical environment, infrastructure, background objects etc. can mediate the practice, educators are trying to facilitate.

Changes in Practices

Inclusion requires special adaption of the practice, which can involve adaption of technologies. Jodie gives some examples of the issues she sees at mainstream schools in the UK, e.g. that a mainstream teacher would write a "timetable for the day" up on a whiteboard, which made it inaccessible to a blind boy attending that class. She gives another example from that same mainstream class:

"A teacher for children his age might say [...] "go and get your spelling books". And they all go across the room to some cupboard where all the spelling books are in a drawer, and they rifle through the drawer and take their one, and get back to their desks. So if you've got a blind child in a class like that, they can't engage in that; it is too difficult, the room is too busy. So he has a drawer unit next to his table with pull out drawers in it – the drawers are labeled in braille."

This is a simple scenario for sighted children that can turn into a practical challenge for a blind student. Jodie exemplifies how a technology like a shared cupboard for spelling books, can be a challenge to get to, for a blind student. Further a whiteboard in a mainstream classroom is a technology that can represent what is considered normal in this setting; the ability to see what is written on it. Jodie express that mainstream teachers have a practice in a mainstream classroom that is not always beneficial for blind and VI children. Jodie has facilitated a different *practice* for the blind student, by placing a drawer unit with braille next to his table, and by

providing him with his *own timetable* in braille format. In these examples, Jodie is trying to facilitate a different practice for the blind student by providing alternative *technologies*. These examples I regard as comparable to Danish mainstream schools.

Bodil who had a VI girl in a mainstream class explains how she changed her teaching practice in order to make it accessible: e.g. by ensuring that the VI student always sat in front of the class, so she could see the chalkboard better. Bodil would be very aware of various adjustments at first, however she says that, after a while; *"both [the VI student] and I got used to the fact that; this is how things are."* Bodil tells me that some of her practice was altered "automatically", but also that her VI student would have to adapt to some things, that might not have been ideal for her. Diana changed some material to meet the needs of her VI student. She did this e.g. by changing laminated images into paper that would *not* be reflective, because the reflection made it difficult for her VI student to see them. Also, she divided the board into colored areas, so her student could orient better with her CCTV. The educators in mainstream schools are clearly trying to alter their practice towards *accessibility*. Verdier and Ek (2014) who studied blind and VI children in Swedish mainstream schools, found that: *"In general, design, physical education, technology, crafts, mathematics, physics, and chemistry were identified by several [mainstream] teachers as being especially difficult to make accessible [for blind and VI students]."* (Verdier and Ek 2014, 465) So what does it mean to make something accessible?

Altering Predetermined Structures

What is noticeable in the educators' examples, is that the *existing* mainstream practice, that is aimed at sighted children, is *slightly* changed in order to "include" (verb) the blind or VI students, by making it *accessible*. The teachers still use the board, however make this more accessible. This notion of "including" *a specific person* by making *existing* structures accessible, is seen in society more broadly. This e.g. involves considering different minority groups in design of technologies, such as making webpage-content accessible for people with various disabilities (World Wide Web Consortium 2018), adding braille to an elevator or removing a doorstep that would otherwise limit someone in a wheelchair. Accessibility is *often* (not always) to make alterations to something that is *already there* or adding some design changes to something that was already a design. Placing a metal ramp, so that wheelchair users can access an old library, or making a website *compatible* with a braille-notetaker by adding tags, is making

some *predefined structure* accessible. Similarly, educators try to make alterations to a predefined practice, that is built around predesigned technologies in a mainstream classroom. At times, the practice in Danish schools would however be changed entirely. In some sports classes, Bodil would play goalball (a game for blind people), by blindfolding all the sighted students. Charlotte occasionally did the same, where all students would be blindfolded so they *"were on the same level as the [blind] student"*. Anna, who works as a TVI in Danish mainstream schools, says that these games are important because they are "equal" and the games make sighted peers *"understand the world that [the VI student] is in"*. Changing the entire practice, would however only happen occasionally and this would be regarded as something out of the ordinary.

It seems as though the educators try to facilitate an "inclusive" practice by either; changing a small part of the *normal* practice for the sake of the blind or VI student, or by removing the other student's abilities to see, and thereby changing the entire practice, to accommodate the blind or VI student. The educators thus aim their inclusion towards "including" *one particular student*, rather than creating a practice towards *inclusion* for *all students*. The mainstream educators *are* clearly making an effort to "*include*" the blind or VI student in an existing practice. *All* educators in this study reported that their students at their special or mainstream schools were included, and *I do not argue otherwise*. What I intend to focus on is how technologies; whether part of a physical environment, tools for individual use, or teaching materials from curricular; *mediate* the practice in various ways. Diana says that having a VI student in her class "was the assignment in my work as a teacher, that has been the most pedagogical challenging". Mainstream educators have the task of making school practices beneficial for *all students*, however, they are dealing with changing something that I suggest is deeply rooted within mainstream school settings: *standardization*.

7.3. Standardization in Mainstream Schools in Denmark, and Elsewhere

Don Ihde argues that *"In the relationship with humans and humans-in-culture, technologies transform experience and its variations"* (Ihde 1990, 144). Technologies transform humans, and humans transform culture. In the following I describe how Danish mainstream schools have been increasingly standardized, but also how the technologies that facilitate this, are also seen outside of Denmark. I wish to suggest, that mainstream schools more broadly in Western European countries, generally are standardized to fit the normal majority, who are not only sighted but also intellectuals, community-aware, abled bodied and overall not 'too' abnormal.

Tests and Common Goals

Danish schools have been increasingly standardized since the second half of the twentieth century (Gilliam and Gulløv 2017b, 35) due to various histories and politics¹⁴. In terms of technologies, National Tests have been developed since 2010¹⁵ to measure the skill levels of students throughout the country (Børne- og Undervisningsministeriet 2020b) testing within English, Math, Physics and Danish reading (Undervisningsministeriet 2017). In 2019, Danish professors within education Jeppe Bundsgaard and Svend Kriner criticized that these tests were used as a quality-measuring tool for municipalities and school leaders – rather than used as the pedagogical tool for teachers, it was intended as. (Riise 2019) Since the Danish Ministry of Children and Education made pamphlets in 1975 with guidelines for the subjects taught in Danish mainstream schools, these have gradually turned into "Common Goals" for all subjects taught in mainstream schools (Børne- og Undervisningsministeriet 2020a). The children's academic abilities can thus be determined, tested, and further compared internationally with PISA tests (Programme for International Student Assessment) (Gilliam and Gulløv 2017b, 46). I suggest that these technologies represent a standardized normal in terms of which academic

¹⁴ See Gilliam and Gulløv 2017b.

¹⁵ Despite the Corona virus, the National Tests will still be obligatory for 20% of the schools with the lowest performance, (Ravn 2020) along with additional chosen classes across the country (Børne- og Undervisningsministeriet 2020c). The government is however planning to phase out the national tests, due to quantitative inconsistencies, and they expect a new, however similar, system within around 3-5 years. (Svendsen 2020)

abilities that are to be expected. Danish mainstream teacher Bodil tells me that her VI student was at the top of her class e.g. in reading. She knows this partly from the National Tests:

"When we did the National Tests and other tests she was.. Despite the fact that she needed the zoom-function and also.. I mean of course she got extra time when doing the test assignments, that is allowed.. But she was at the very top of her class!"

Here is one area where the VI student, despite her "need" (dependence) of special literacy technologies and extra time, fits the normal skills, as they are determined in standardized tests. Bodil believes that if her student would have had learning difficulties along with her visual impairment, she would not have succeeded as much. She says: "If you are as intelligent as she is, then I definitely think it is an advantage to be in a normal class, because she takes example from normal children and get a more normal life." Charlotte's student, a blind boy, would however not fit the normal academic abilities as measured in the National Tests. This might be one of the reasons why the blind boy is attending a special class, within a mainstream school, rather than a mainstream class. Mainstream educators are expected to facilitate inclusion, by providing Assistive Technologies, accessible teaching materials, and adapt their normal practice. However, the Common Goals still need to be reached; the normal students should not get bored, and sighted children cannot be blindfolded in all sports-classes. Inclusion after integration implies that mainstream educators need to consider *all children* in a diverse way, however they are expected to do this within a standardized setting. Laura Gilliam (2017) argues that Danish mainstream teachers are partly focused on creating a well-functioning community in each class. Further she suggests that the "civilization" of children, e.g. through teaching proper behavior, is closely linked to this community aspect, and cultural ideals within Danish society (Gilliam 2017, 109-110). This community focus is also found in how the educators in this study describe their practice, however I intend to further suggest that the practices within mainstream schools are also based in the standardized technologies, infrastructures and physical environments in Denmark and *elsewhere*.

Anthropologist within education, Alejandro Paniagua (2017) did fieldwork in mainstream schools in Catalonia, Spain and found that: *"Overall, tests and homework were not tailored to meet the diverse particularities of children and had a constitutive function of shaping the one-size-fits-all character to most activities."* (Paniagua 2017, 152) Although the educational system in

Spain *cannot* be compared to the Danish, I argue that the standardizations can. Paniagua observed how three students with various socioeconomic and cultural backgrounds, were being left out during class:

"In diverse and subtle ways, the pressure of the curriculum, the permanent scarcity of time, and the inability to offer alternative, more discrete pedagogies, underpinned the withdrawal of [the three students] from the class" (Paniagua 2017, 152)

Paniagua argues that school policies and structures are part of this, and the *teachers* are unintentionally excluding some children through their daily classroom practice, because they are "naturalizing" this practice within their pedagogical assumptions of what a "normal" child should be (Paniagua 2017). Again, I do not have empirical grounds to argue whether the educators in this study are *including* or *excluding* students, and neither is this the scope of this study. Rather, I suggest that technologies such as homework, tests and curricula can greatly mediate the practices towards one-size-fits-all, along with the physical environment of boards, preparation time, size of classes etc. found in general, at mainstream schools, both in Denmark and *elsewhere*.

Physical Environment and Infrastructure

The physical layout of a mainstream classroom can often include boards as the visual focal point for *all students* to look at: what is written there is for all students to grasp. Challenges for blind and VI children can further be long distances between the front and back of the class, cupboards for all students to share and lamps high up in the ceiling. For a blind or VI child, chairs, tables and school bags can also act as obstacles. The materials available from curricula often include standardized spelling books, math books with images, print text etc. which is made to accommodate the normal child. The entire *setting*, and technologies within it, is designed; not only for visual orientation, but for the majority. It is designed to accommodate a large class at once, and materials available are meant for what the average normal student will find useful. In Danish mainstream schools, the average teacher preparation time was measured to be 7,2 hours per week in 2018 (Danmarks Evalueringsinstitut 2018). In this time teachers do a variety of tasks, *and* prepare for Danish mainstream classes with an average of more than 20 students (Børne- og Undervisningsministeriet 2018). The standardized settings and environments are also described by TVIs outside Denmark. Jodie, who works as a TVI at mainstream schools in the UK says:

"I've got a difference of opinion about whether mainstream inclusive education really works for children that are blind and visually impaired. Obviously when I go out that is my job, and that's what I'm doing – I'm doing my absolute best trying to work for the children in this setting, but there are so many things about the mainstream school setting that are impossible to change, that are not conducive to our children learning in that setting." She further says: "I find a lot of my [blind and VI] children in mainstream are so distracted by the environment and by social things going wrong and, that their learning is impacted."

Mia is a TVI who works at a special school in Germany. Mia describes Chemistry classes as challenging in mainstream schools. She believes that blind and VI students benefit from working in *smaller* groups in order to learn through touch or listen to a *"thermometer that speaks"*. However, she says: *"In a class of 30 students you cannot do this, you have to listen to someone describing to you how things work."* I do not intend to compare the quality of educational systems in Germany, Denmark the UK or Spain. Rather I clarify that some standardizations; limited time, distracting environments and large classes are issues the TVIs describe, in foreign mainstream schools as well.

While writing this thesis, an interesting phenomenon have arisen in Danish mainstream schools. After the schools re-opened under special circumstances during the Corona-situation; teachers and researchers have started commenting on the benefits of the schools being *less* standardized. A Danish teacher Sarah Urgaard wrote the 11th of May 2020 about the improvements, which I translated as follows:

"The students have been given shorter school-days, teachers have fewer top down, ambitious demands for content and goals, fewer students in the groups, fewer conflicts between children, fewer adults for [only] one group, more calmness and more presence." (Urgaard, 2020)

Urgaard was interviewed in a recent magazine article the 25th of May 2020, where she says: "*I* don't need to rush to meet all of the Common Goals and year-plans. I can lower my shoulders and we don't need to hurry; the students can feel that." (Richter 2020) In the same article published in "Information", the journalist interviews politicians, pedagogical researchers and educational
researchers, who describe how they have noticed positive reports from mainstream teachers. This includes outdoor classes, less testing and more time for smaller groups of students. I myself have spoken to two Danish mainstream teachers working in re-opened schools, who also report that the outdoor classes, fewer goals to reach and smaller groups of children have improved their work in many ways. One teacher described that this resulted more time to consider children with special needs, who are integrated in a mainstream class; something also mentioned in the article by Richter (2020). A pandemic has tragic consequences; this is undebatable. However, it also forces us to abandon everything we consider normal. This can reveal new avenues of the *abnormal*, and how our practices might not always be beneficial, solely because it is the way things are done. Although it is too soon to conclude on the current situation, the examples illustrate that standardized technologies; physical environments, tests, Common Goals, class sizes and preparation time does *mediate the practice itself*.

7.3. In mainstream school settings; tests, common goals and regulation determines what normal academic abilities are expected. For children who can fit within these, they might experience greater success, even though they have an abnormal visual impairment. The physical environment, limited preparation time and large classes is seen within Danish mainstream schools and elsewhere. Teaching children to be in a "community" of normal children is also expected in mainstream schools, not only in Denmark. Technologies shape this practice in mainstream schools, and they affect cultural normalities. These normalities are not only driven by visual norms and being "social" through sight, as I have demonstrated in the analysis. Normality is also driven by a standardized setting towards the average, majority of children. Inclusion is something that are left with the educators, however standardizations and regulations *can* at times, seemingly defeat the purpose of approaching individuality. Although this standardization *has* been a debate for years, it seems as though a pandemic might reveal how much these standardizations matter; normality has truly been challenged in 2020. Not only blind or VI children, but other children with various special needs attends standardized mainstream schools. These children have passionate educators who try their best to change a standardized educational system that I suggest, is not made for individuality. And it can be questioned whether inclusion is even possible within standardizations.

7.4. The World and Standardization

Throughout this study, the reader will have noticed that I regard *terminology* as important; "normal", "inclusion", "literacy", "technology", "disability", "visual impairment" "perception" etc. I have clarified these terms, because I argue that the way we use languages in *literacy activities*, whether in research, the media, politics, or in this Master Thesis, can *also* mediate these practices. Words matter, and many terms used in this study have great histories; *the words I write, and the medium it is perceived through, are the very technologies the reader perceives.* Therefore, before concluding this thesis, I intend to return to the matter of a "blind world" and a "sighted world", before suggesting that the world is standardized. This is followed by what I regard as important in this world, and within "inclusive education".

The Majority's World

I ask Jodie why blind and VI children are being taught visual norms e.g. facing other people, and looking appropriate. She says:

"In a predominately sighted society we do have a responsibility to teach them these things, but I sometimes feel that we are forcing our world onto them. But unfortunately, the only way for them to have success in our society, which is predominantly sighted, is for them to learn these things."

Because the world consists mostly of sighted people, it is expected that blind and VI children learn adapt to this; the minority should conform to the majority *for their own sake*. When Jodie says *our world* she means the world of sighted people. Within this lies the notion of *their world* being something else; what some call the *blind world*. Educators describe blind and VI children as sometimes being "in their own little world". They talk about the children being with other blind or VI from "that world" or pulling away from "the world around them". Even when the educators do not use the term "world" in particular, they refer to "mainstream society" or a specific setting that is different from "the rest of the world". I have suggested that the educational setting of a mainstream school is defined by the majority who attend this school, and in this study the focus has been on their ability to see. Vision is *normal* and having a visual impairment is *abnormal*. This, I suggest, is also a broader normality of the world, which in similar ways is defined by the majority of people, who are sighted. What then, about the cultural relativistic normality? Ruth Benedict almost defines this normality herself: *"The very eyes with*

which we see the problem are conditioned by the long traditional habits of our own society" (Benedict 1934, 73) Indeed normality can change in *settings*, however *vision* and the "eyes with which we see" is so dominating, in our language, practices, designs, infrastructures and world, that I will dare to call it: a *worldly normality*.

Using the term "world" within a phenomenological framework is also challenging, so to clarify; I refer to the *world* of objects, humans and practices and anything in-between. The world is something that is *perceived*, and it is only 'true' in the individual person's experience of it, mediated by their interpretation. Blind and VI people have a different *experience* of the world; which I regard is the reason some call it a blind world. To us all, it will always be the *I-world*. What Martin Heidegger calls *being-in-the-world* implies that the world does not exist "out there"; the world is our lived experience of it and in it (Dasein) (Heidegger [1954] 1977). Similarly, I do *not* consider facts and knowledge as "out there". However by adding an extra adjective to "the world", it changes the focus towards the fact that the world in which we are all in, is *designed for* the vast majority; what Jodie calls a sighted society. Thus the world is *perceived* differently by all people, however the majority does this partly through *vision* before interpretation. The world I could also call "the sighted world", "the abled world", "the normal-intellectual world" or simply: *the majority's world*.

Design-for-All or Design-for-More?

I have suggested that technologies in mainstream schools are standardized towards the majority; this is also the case in the majority's world. Jodie is glad that some technologies like games and tools are made for blind and VI children, because as she says: *"nobody does.. nobody bothers.."* The majority's world is standardized, best exemplified through our design of technologies. Designers who does e.g. "Universal Designs" tries to aim "all people", e.g. by designing a house while considering people with cognitive challenges and various physical disabilities, along with other groups that are less common to design *for*, e.g. elderly and pregnant (Tremblay 2003). The trend is also called "design-for-all" (Bougie 2002, 18), however these designs are arguably still design-for-the-majority *incorporating alterations of* design-forminorities. The movement towards "design-for-all" I do consider important, because it forces designers to consider the individuality of *more* people. However, like with "inclusive education", it can also be questioned why the main goal of the design is still one-size-fits-all.

Although designs can be made while considering *differentiation*, the design *itself* can still be said to represent *standardization*. I do not suggest that standardization is something to abandon. Neither do I regard it as purely successful when designing standardized technologies both in and outside educational settings. So where is the issue, and what is the alternative? Designing products, houses, cars and educational settings for the needs and preference of *each individual person in the world*, does not seem sensible or financially possible. Technologies and buildings that are 'specially made' are costly: customization is a *luxury*.

Jodie says: "the world does not do a lot to respond to the needs [of blind and VI children], unless it is health and safety." What I consider beneficial is that we continue the effort of making buildings and technologies not only accessible but beneficial to as many people as possible. Indeed, websites should be designed for more people, teaching materials should be made for children with cognitive challenges and elevators should be useful for blind people. The world should respond, while acknowledging the fact that design-for-all is simply not possible. Some people cannot use IT due to immobility, some cannot do math, and the blind person might not be able to read braille in the elevator. We should continue to strive to design-for-more in many cases, however we must also meet the people who do not fit into our standardizations. From these people we should learn, try again, or find alternative solutions.

The attempt of a "universal design" seems to have ventured into the Danish mainstream schools. In Denmark in 2012, 94,6% of children were in mainstream education and the remaining 5,4% of children were segregated in special educational settings. In an attempt towards what one might call a 'school-for-all', the government made a goal in 2012: children in mainstream, should be increased to 96%. (Social-Indenrigsministeriets og Benchmarkingenhed 2019) They call this the "inclusion degree" (Børneog Undervisningsministeriet 2020d). Schools and municipalities worked towards the ideal 96%, and they came close in 2015 with an "inclusion degree" of 95,2%. In 2016, these official percentage-goals were removed, while "inclusion", was still encouraged as much as possible. Last year, the so called "inclusion degree" had fallen back to 94,7%; almost the same as before,



back in 2012, when the goals were made. (Social- og Indenrigsministeriets Benchmarkingenhed

Many factors could have played a role in the rise and decline; however, this is beside the point. Rather I intend to imply that there was a rise in what I define as *integration* between 2012 and 2016. I find no report on the national effects of *inclusion*, presumably due to the challenge of measuring this; and because no agreement of the term has been found. The removal of the percentage goals might have been an effect of the realization that children's *individual* needs did not correlate with the 96% goal. Or maybe some officials acknowledged that *numbers*, and nice *words* such as "inclusion degree", do not guarantee *inclusion*, because this task sits with the educators. I am tempted to ask; were these percentages made to accommodate the needs of children? Or were the children there to accommodate the statistics and standardization?

The current 5,3% of children in special educational settings, *might* be better off in segregation. And is this so bad? Maybe these children do not fit our standardization of a "school-for-all" or what I would rather call an attempt towards a school-for-more. Some of these children might experience inclusion within segregation. And if so, maybe they deserve to stay there: *in the luxury of customization*.

Figure 5: (Social- og Indenrigsministeriets Benchmarkingenhed 2019, 4) The stippled line illustrates removal of the 96% goal in June 2016. The authors note that this graph is made from their own calculations and statistics from Danmarks Statistik.

7.5. The Importance of Technological Mediation

I have argued that technologies take on different roles: they are shaping cultural normality, while also taking on different roles shaped *by the normalities* in the setting in which they are placed. So what can we learn from blind and VI children, in relation to "inclusive education" and the world?

- At Computer Camp, literacy technologies represented experiences that the children could have with other blind or VI. The technologies represented the children's "abnormal" perception that they have in common, and this way they could compare to each other, through the technologies. Computer Camp represents, to me, the very notion of *inclusion*. A setting that was fitted to the needs of *all children* within it, where unique technologies facilitate and represent what they have in common, and what they do not have in common with the majority's sighted world. Learning to use special technologies as tools, together with someone who has a similar condition of life as oneself, can be a joyful experience and inspiration for some children to learn. What Computer Camp reminds us, is that inclusion *can happen* at places that are called 'separated', 'isolated' or 'segregated' from mainstream schools.
- In special schools, the individualized literacy technologies are considered normal. The children have unique needs and abilities, so the technologies are tailored to fit those needs exactly. From this we might learn that *all* children, whether having a disability or not, low or high IQ, 'normal' or 'special', *perceive things differently*. That all children have unique educational needs, and that there are different roads and technologies towards learning. We acknowledge this as adults; some prefer reading on paper, some cannot read and therefore get information through audio, and some like myself, learn best through multimodal mediums like physical colored paper when coding data. Why do we not translate this into educational settings? Nancy says; *"I think just acknowledging that there are differences, you know? Young people have differences, so educational things sometimes need differences as well."* What TVIs at special schools seemingly do is *normalizing individuality* in practice. And maybe we should learn from this; and aim towards creating mainstream educational systems that are more suited towards the uniqueness of human experiences.

In mainstream school settings I have argued that literacy technologies take on dual 0 roles; they can be considered abnormal, while supporting the blind or VI children to increase their normal abilities, including independence and literacy activities, similar to their peers. When blind and VI children are in a setting where they are the only one using a special lamp, this lamp can become a symbol of their disability and abnormality. The lamp is part of them, and part of how others 'see' them; it can represent their abnormality and dependence, while facilitating their access towards what is somewhat regarded normal abilities in these settings. What we are reminded is that technologies humans in general use and have, whether it is our clothes, glasses, houses or cars, can become a part of ourselves as we use and own them, and that this might affect how we experience ourselves, and how others experience us. With the increase in standardized testing of the expected 'normal' abilities of children, along with expectations of children accepting a majority's world of "the way things are", it does not seem difficult to grasp why the children-with-their-technologies are at times seen to be reluctant to use and have these abnormal technologies. Simultaneously the technologies are observed by educators as the very thing that can make them 'fit in' in some situations; the technologies are both wanted and unwanted. We are reminded that technologies play a large role in educational settings, from the standardization of teaching materials, tests of normal abilities and Common Goals, to the design of classroom environments and the infrastructure of planning and class-sizes; these things *do matter*. This in turn points to the importance of a socio-technical approach, which I argue should be present in *any* social science: technologies mediate - they are not neutral. I argue that technologies should be up for debate, whether we discuss, research, explore or write about human practices in any setting.

8. Conclusion

Blind and visually impaired (VI) children are not a homogenous group, they are individuals who share a similar disability: visual impairment. These children can be educated in a setting of a special school for blind and VI children, primarily by specially trained Teachers for the blind and Visually Impaired (TVIs). The majority, however, are taught by either a mainstream teacher or teaching assistant, with support from a TVI, in mainstream school settings. Like other children, blind and VI students are taught literacy where they read, write, interpret and use their knowledge in activities. Various technologies are used in these activities, including braille mediums, enlarged print text, special lighting or auditory mediums. These literacy technologies take on different roles depending on the setting in which they are used. Further, technologies within settings represent and shape the standardized or individualized normality. With a Techno-Anthropological interdisciplinary approach, I have created knowledge through fieldwork at a Computer Camp for blind and VI children, along with interviews with various educators who work with children with a visual impairment, in settings of mainstream schools and special schools. This knowledge, I have interpreted within a phenomenological framework of embodied perception and post-phenomenological terminology of mediating humantechnology relations.

Blind and VI children within mainstream school settings are surrounded by sighted peers and sighted educators with various training in teaching sighted children. This is "inclusive education" where normalities are defined through various abilities; of interest in this study has been the ability to see. Educators teach their students visual norms, such as facing other people, behave properly and not make themselves stand out by looking inappropriate. Such behavior is learned, evaluated and understood through visual cues from other people, which can make it challenging for children with a visual impairment. The educators describe how the children struggle with "the social", partly because they cannot read the visual cues when interacting with others in a community, where normality is partly driven by vision. When the educators teach literacy, blind and VI children use literacy technologies that are different from their sighted peers who mainly use text. This results in the educators' observations of their blind and VI students being unmotivated to use their special abnormal technologies, in a setting where textbooks and other visual literacy technologies are a culturally defined normality. The educators also strive to teach all their students to do things themselves, without being

dependent on other people or digital technology. However, because blind and VI children use, and are described as being dependent on digital technologies such as auditory mediums or magnifying software, this goes against this understanding of independence as a normal ability. Conversely the educators describe how the special literacy technologies assist the students in gaining abilities that are closer to the normality in this setting. The literacy technologies allow VI students to expand their perception and thereby having literacy experiences that are similar to their sighted peers. Technologies also allow the blind and VI children to do things independently without the help from others, which is considered a valued normal skill within a mainstream school. Technologies for blind and VI children are in "inclusive education" described as both wanted and unwanted, abnormal and normalizing, needed and liberating: technologies are multistabilizing in various ways in visually driven settings. Educators within these mainstream school settings try to alter their practices in order for their blind or VI student to be "included" in a class of sighted peers. Some educators alter teaching material, and others place the student closer to the board so they can see better. However, the teaching material and the board itself is mediating and shaping normalities and practices within mainstream school settings. Educators are expected to facilitate inclusion in their practice but blindfolding all students or removing the board from a classroom is not always ideal, when they are also expected to teach Common Goals, prepare for the National Tests and teach large classes with limited preparation time. Mainstream school settings are standardized towards one-size-fitsall, and the technologies are mediating educators' practices. Having any child with individual needs in their class, forces educators to try and alter an entire setting that is already designed for the majority of normal children. With a tragic pandemic, these normalities are turned upside down, and educators report that this has led to some improvements that is worth taking note of; less standardization. This has left more room to meet individuality of all children, which is the definition of inclusion I have approached in this study. The goal of "inclusion" in Denmark, is however described as children with various needs and disabilities, not being separated from the children who do not have "special needs". However, in these segregated settings, we find a normality which is rooted in individuality, rather than standardization.

At special schools for blind and VI children and at a two-day Computer Camp, children are together with peers where they all have one disability in common; visual impairment. This results in a different normality, where non-visual perception is the cornerstone of these settings. Norms and "the social" interactions with peers are not driven by vision; they are driven by many other unique embodied perceptual experiences that the children can share and have with each other. They can compare, play hide and seek and be inspired with and by others with a visual impairment; in settings where this is a normality. A sighted researcher like myself is reminded that I cannot understand these children's perception, or any other person's perception. A person's experience of the world is unique and being around blind and VI children is a clear reminder of this. The blind and VI children are in these special settings using unique literacy technologies, bumping into furniture and have various skills; some are good at reading braille, some cannot read and therefore listens to auditory mediums, and a third is a talented pianist. Despite their common disability, they all still have individual needs, preferences and abilities, which make them just as unique as anyone else. This uniqueness of the children is clarified through the unique literacy technologies they use. TVIs at special schools spend much of their time adapting standardized teaching material in order to suit the needs and preferences of each child. The TVIs can do this in special schools, because they have the preparation time needed, smaller groups of children and physical environments that are not designed towards the majority, but rather for individualization.

Within the majority's world, where the average person is able, intellectual and sighted, some minorities are referred to as "disabled" or having "special needs". With this, we design technologies, schools and environments for the majority, however try to incorporate alterations to "include" some minorities. We call it "design-for-all" or "inclusive education" and believe that with a few tweaks towards accessibility, we can standardize for all individuals. The intentions are good, and the design-for-*more* is important; however we can lose our attention of individuals who might not fit within these standardizations. These individuals can be blind or VI children, people with various diagnoses and disabilities, or: they can simply just be any individual with unique perceptions, needs, abilities and preferences. *This Master Thesis is not about visual or non-visual perception:* it is about individual perception. Individuality should not be a luxury, but in a majority's world, it is; standardization is a worldly normality. If we do strive for inclusion, in education and elsewhere, we might need to recognize that perception belongs to the unique individual and that we cannot all fit in our standardizations. Further we need to remind ourselves that *we* mediate the technologies around us, on us and with us, and that *they* mediate our very individual existence as humans; technologies are not neutral.

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