informatics

MDPI

Article

Disabling and Enabling Technologies for Learning in Higher Education for All: Issues and Challenges for Whom?

Sangeeta Bagga-Gupta [1,*,†], Giulia Messina Dahlberg [2,†] and Ylva Winther [3,†]

1 School of Education and Communication, Jönköping University, Jönköping 551 11, Sweden
2 School of Health and Education, Skövde University, Skövde 541 28, Sweden; giulia.messina.dahlberg@his.se
3 Karlstad Municipality, Nyed Primary School (13–16 years), Molkom 660 60, Sweden; ylva.winther@karlstad.se
* Correspondence: sangeeta.bagga-gupta@ju.se; Tel.: +46-036-101-419
† These authors contributed equally to this work.

Academic Editor: Antony Bryant
Received: 18 December 2015; Accepted: 25 October 2016; Published: 28 October 2016

Abstract: Integration, inclusion, and equity constitute fundamental dimensions of democracy in post-World War II societies and their institutions. The study presented here reports upon the ways in which individuals and institutions both use and account for the roles that technologies, including ICT, play in disabling and enabling access for learning in higher education for all. Technological innovations during the 20th and 21st centuries, including ICT, have been heralded as holding significant promise for revolutionizing issues of access in societal institutions like schools, healthcare services, etc. (at least in the global North). Taking a socially oriented perspective, the study presented in this paper focuses on an ethnographically framed analysis of two datasets that critically explores the role that technologies, including ICT, play in higher education for individuals who are "differently abled" and who constitute a variation on a continuum of capabilities. Functionality as a dimension of everyday life in higher education in the 21st century is explored through the analysis of (i) case studies of two "differently abled" students in Sweden and (ii) current support services at universities in Sweden. The findings make visible the work that institutions and their members do through analyses of the organization of time and space and the use of technologies in institutional settings against the backdrop of individuals' accountings and life trajectories. This study also highlights the relevance of multi-scale data analyses for revisiting the ways in which identity positions become framed or understood within higher education.

Keywords: functionality; disability; technology; higher education; support services; ethnography; learning

1. Introduction

"Like policies and programs, technology seems to have the capacity to identify, define, and transform the significance of disability. As in the case of policies, programs, and organizations, however, technology must be analysed and understood within a social context" [1] (p. 18).

Technological innovations during the 20th and 21st centuries, including the exponential growth of Information and Communication Technologies (henceforth ICT), have been heralded as holding significant promise for revolutionizing issues of access in societal institutions like schools, healthcare services, higher education (henceforth HE), etc. (at least in the global North). Taking a socially oriented perspective on "ways-of-being-with-words" [2], including language- and technology-in-use (see Section 2), the study presented in this paper explores the ways in which individuals and institutions use and/or account for the roles that technologies, including ICT, play in enabling (or disabling)

inclusion, transitions, and participation for learning in HE, which is envisaged as being open to *all* citizens in society.

The range of capabilities that are provided for and/or hindered in the everyday lives of individuals, i.e., functionality, and the role that technologies play in the lives of human beings, is focused upon in terms of dimensions of everyday life in institutions of HE in the 21st century. This was explored through a critical scrutiny of six Swedish university websites in 2015. These online platforms were studied with regards to their services for different student groups and personnel (including the differently abled). This was complemented by an analysis of case studies of two differently abled individuals who have been students in HE in the 21st century in Sweden. (While we recognize that boundaries of geopolitical spaces of nation-states (like Sweden or Italy) are problematic units for analytical purposes, pursuing supraregional positions is beyond the scope of the present paper. In other words, the geopolitical spaces—including virtual spaces of Sweden—are termed Sweden in this study.) The results presented in this paper will, it is suggested, function as a point of departure for a more informed and reflective discussion about the role that technologies, institutions, policy makers, and not least students and personnel (including faculty) play in the creation of flexible, open, and inclusive transitions in and across the Swedish HE landscape in the 21st century.

2. Theoretical Framings: Ableism, Learning, and Technologies

2.1. Access and Participation: Technologies and Education for All?

Technologically disrupting innovations like personal computers, smartphones, tablets, etc. have enabled widespread access to educational content as well as to other people who share similar needs related to (im)mobility [3,4]. The advent of the Internet has brought greater accessibility to educational content through e.g., open educational resources (OER), massive online open courses (MOOCs), or institutionally framed online educational activities. The last two decades have concomitantly seen the emergence of an interest in the study of alternative (virtual) spaces for learning and instruction, not least since education is potentially open for everyone, anywhere 24/7, especially when it comes to asynchronous online learning [5,6]. This does not mean, however, that such openness and flexibility are general, global prerogatives. The direct causality (implied in positivistic approaches) between a greater openness and accessibility and the use of digital technology is, from a humanistic perspective, considered simplistic and reductionist. In other words, the latter perspective suggests that technology in itself cannot be reduced to an agent that enables access. As Whyte and Ingstad highlight, "[o]ne of the most important dimensions in the study of technological change is its implications for patterns of sociality" [1] (p. 20). Such a conceptual position, where the focus is on the patterns of sociality, implies a view of technology-in-use both in terms of the complex affordances and constraints that are made relevant in specific situations.

Some of our previous research in school settings shows that access to technologies does not automatically create opportunities for learning and participation (see e.g., [7–9]). For example, our studies of mainstream primary grade classroom settings where cochlear-implanted deaf and hearing pupils are members have identified three types of technologies-in-use: (i) hearing technologies; (ii) literacy technologies; and (iii) communicative-link technologies. Hearing-related technologies facilitate sound perception and include microphones, the implants, as well as noise-reducing adjustments such as school desks with self-closing lids and special ceilings with acoustic tiles for creating a special acoustic environment. Literacy-related technologies or tools have, in our previous studies (see e.g., [7,10,11]), been reported as including SMARTboards, pictures of the alphabet combined with Swedish Sign Language (henceforth SSL), a hand alphabet for each letter, pictures, pens, books, etc. The third group of technologies in these previous ethnographically framed studies are labelled "communicative-link technologies" [12,13]; these include human beings or textual artifacts that focus on people and their linguistic behaviors. For instance, interpreters and resource persons who relay spoken communication into SSL have been identified in terms of communicative-link

technologies. Classroom posters with the SSL hand alphabet, or words and phrases in English or other language varieties that support as well as highlight communicative resources in the classroom environment, are also described in terms of this third type of technology. What is important for the purposes of the present study is the fact that access to hearing amplification technology like Cochlear Implants (henceforth CI) does not imply that deaf students become automatically included in the social practices in classroom settings. Rather, such studies illustrate that technology used by teachers and resource persons (or assistants) inside classroom settings tends to become a power tool that is curtailing some social practices; such technology-infused classrooms nevertheless get framed in terms of a better, inclusive environment for deaf pupils with CI. This issue is also illustrated in Winther's and Bagga-Guptas' studies of access and participation possibilities in mainstream middle school environments where a blind pupil is a member ([11–13]; see data presented on this case in Section 3). Thus, the role of resource persons or assistants and technologies bring to the forefront some complexities that enable but also disable inclusion. In other words, access to formal education and the deployment of technologies cannot per se be equated to inclusive participation or what is glossed in the concept *one education for all*.

2.2. A Socially Oriented Position: Languaging and Doing Identity

New technologies, including disrupting technologies and assistive technologies, have altered the constitution and experience of functionality. Assistive technologies potentially include disruptive technologies, but refer primarily to special accommodative technologies designed for or used by differently abled individuals. Thus for instance, CI, braille machines, text-enhancing screen programs, etc. constitute assistive technologies. Digitized assistive technologies can also come under the disruptive technologies umbrella. While assistive technologies are said to hold major promise for enhancing the life quality of the differently abled, there exists a paucity of research that focuses on how these explicitly contribute to inclusion in educational environments generally and in institutions of HE specifically. A humanistically framed, socially oriented position on learning, communication, and identity recognizes that interaction including language use (or "languaging" [14]) and the deployment of technologies is a fundamental dimension related to socialization and the performance of human identity [15,16] across the life trajectory [17,18].

Vygotsky's [19] much quoted phrase regarding the zone of proximal development can here be extended and explicated by arguing that children and adults are potentially capable of more than what they can achieve as individuals when they use technological tools in addition to interacting with more experienced others. Such a socially oriented position highlights the significance of cultural tools and mediated action: it is the engagement of material and intellectual tools and technologies that provides a "natural link between action [...] and the cultural, institutional, and historical context in which action occurs" [20] (p. 24). It is thus through the appropriation of tools and technologies that human beings get socialized into and positioned as specific types of individuals. A socially oriented position focuses upon *the doing of* language and identity (instead of conceptualizing them as a set of linguistic systems or a range of fixed identity categories [15,16]). Language use or languaging, rather than language (as a system) per se, highlights an analytical focus on the performative dimension of communication and social practices. Furthermore, identity is not conceptualized as an attribute (like handicap*ness* or gender*ness* or nation*hood*) people carry with them in a hidden or passive fashion. Rather, it is a process and a product that emerges within social practices. Thus, more recent analytical concepts like "languaging" and "doing identity" (or "identiting") point to the performative nature of human life [14–17,21,22] i.e., as constitutive in action, through the opportunities and barriers that people have access to and can participate in, in different settings. Individuals dialectically learn to live up to the identity framings made available in and through institutional settings [22]. Such framings imply that participation is constituted by individuals collaborating with others, in close symbiosis with technological tools. Such a position, furthermore, encompasses an orientation towards approaches where the study of time and space and a focus upon human beings in interaction with one another and

cultural tools are salient [2,20,23–27]. This then constitutes dimensions of a sociocultural/dialogical perspective on communication, performativity, and learning. Combining these analytical positions implies that policy, learning, and identity cannot be assumed to exist or take place in a social vacuum or in some neutral fashion.

Thus identity is, in the present study, understood *relationally* [10,28,29], i.e., as a process rather than in terms of an authentic essentialist core marked by different layers of functionality. In other words, the self is considered as being constituted of multiple layers of *possible* identifications; individuals "play out" various positions (such as women, immigrants, dis/abled, homosexuals, etc.) within the framings of both mundane interactions and textual arenas (e.g., in policy or other documents inside or outside online spaces). None of these positions is more fundamental than any other. They are negotiated in daily life and in texts and they thus vary across time and space [16,29]. This means that functionality can be investigated at any given point on an *abilities continuum*. These theoretical positions entail a focus on people giving meaning to, interpreting, and creating realities through their participation in practices that are layered in power relationships, including those that are mediated by technologies. Such a line of argument allows us to focus upon positions that technologies enable (or disable) in HE settings. They, furthermore, shed light upon the ways in which individuals and institutions both use and also account for the roles that technologies, including ICT, play in enabling (or disabling) access to learning in *higher education for all* in the 21st century. Such a socially oriented, theoretical point of departure is very marginal in the research literature that focuses on functionality or functional dis/ability.

3. Methodological Issues: Approaching the Learning Situation of Functionally Disabled Students in HE

The empirical data focused upon in this study have been created through collaborative work in and across parallel projects. Using ethnographic approaches, the following types of materials have been scrutinized specifically:

1. case study ethnographic data that focuses on two young people from different projects:
    - Jonny, who has been followed since middle school at the turn of the century and through the university level in the 21st century, and
    - Olle, who has been followed since the end of the 1990s in high school and through the university level in the 21st century;
2. websites of the following six universities in Sweden: Gothenburg, Karlstad, Lund, Stockholm, Uppsala, and Örebro.

Analyzing and juxtaposing this material has allowed us to move across different scales: between that of lived experience (the case studies dataset) and structural provision of support (the webpages dataset). Names of individuals used in this study are fictitious and the individual universities focused upon are not identified in the analysis presented in Section 4.

3.1. Case Studies: Projects JC and RGD

The empirical data pertaining to the two case studies consists of extensive fieldwork notes, video films from inside and outside classroom settings (This specific data is available from both projects Jonny Carriers and Riksgymnasiet för döva, National high schools for the deaf (henceforth JC and RGD) at the pre-university levels. Project JC also has this type of data from the university level.), open-ended interviews, and analogue and digital images from everyday life outside classrooms in different projects. Ethnographically framed projects allow for understanding individuals' lives across sites and time. Taking the aims of the present study as a point of departure, the analysis has included revisiting extensive data in projects JC and RGD from the turn of the century and scrutinizing new data from 2013 to 2015. The two young adults focused on here are differently abled: Jonny is

blind and Olle is deaf (both since birth). Olle completed his teacher education at university level and is employed as a teacher for the deaf. Jonny has a few courses left in a professional university program and is unemployed. Both are recognized by Swedish society as successful young people. Being successful, from a societal point of view, includes having moved away from one's parental home or other institutional living arrangements and living independently. Participation in HE is a further dimension of this success.

Meetings with Jonny and Olle have taken place in a number of different arenas and include different university campuses (each has studied at two different universities), restaurants, barber shops, excursions in nature, sports venues, their homes, car journeys, etc. We have also communicated with Jonny and Olle using Swedish and SSL and different ICT technologies, including smartphones, Skype, and e-mail.

3.2. HE Websites

Using an open-ended ethnographic approach, the websites of six universities were identified (chosen at random from a total of 16 in the nation-state of Sweden) to constitute a representative sample. These websites have been studied primarily through an inductive search method whereby screen-shots and citations of relevance have been noted. The goal here was to gain an understanding of the overarching types and range of services provided by universities in Sweden in the 21st century and the ways in which students (and staff) are positioned; the aim has not been an analysis of the individual university profiles. This means that we refrain from identifying specific universities in the analysis. The six universities in this dataset are referred to as University A, B, C, D, E, and F.

This dataset was generated stepwise. Firstly, relevant webpages were identified and saved. Relevance here is framed in terms of links between pages. In other words, the ethnographic nature of the study did not initially pose specific questions to the data; rather, the content of the pages and the existing links guided the direction of the initial search. An important issue involved setting the boundaries of where to look or, in other words, the boundary of the (virtual) field. As is often the case in (digital) ethnography and anthropology, doing fieldwork entails setting the stage of the study in terms of what to include and exclude for the purposes of analysis. Since spatial boundaries do not constitute relevant framings (see also [30]), it was necessary to approach the study of Internet-based sites of engagement in terms of *relevance of content*. A fruitful limitation here was the inclusion of webpages as long as they were part of the domains of the six universities. This means that external sites that did not belong to the domain of these six universities have not been included in the dataset or subsequent analysis.

Secondly, the pages included have been scrutinised and emergent themes related to the specific interests of this study noted at the next level of analysis. Some relevant questions that were posed at this stage included: *Who are marked as differently abled students*, and *personnel/staff*? In other words, what types of concepts related to otherness—gender, ethnicity, abilities—are deployed for framing different groups in this dataset? Furthermore, *what support services are (accounted for as being) provided, including for whom* and, more specifically, *what are the analogue/digital technologies included in the overall support* specifically framed for the target group "students with disabilities" as well as "personnel with different abilities"? *How is this support delivered and to whom?* Thirdly, pictures from the webpages have been included in the analysis. These semiotic resources have an important bearing on the ways in which individuals with disabilities and the technologies made available for them are framed at institutions of HE.

4. Technology, Access, and Participation: A Technification of HE?

Analysis of the university websites, as well as the two case studies, has given rise to four primary themes that need to be understood in terms of emerging tensions or paradoxes. These themes are presented in the following sections.

4.1. Identification of Differently Positioned People: In/Visibility and Services for Whom?

The analysis highlights an issue concerning identity work (or doing identity [16,31]) in terms of a double-edged sword. For instance, students need to be identified as disabled (or as gendered, as a minority, etc.) in order to qualify for attention in the services provided by universities (in the webpages). This identity work is significant since without a relevant label or category, support services cannot be made available. Such an issue is also salient in the research enterprise; scholarship is itself (in large measure) organized within domains such as disability, handicap, etc. [32,33]. In other words, an identity position (e.g., gender, ethnicity, specific disability label) can be seen to be a prerequisite for making support available and for conducting research in identity-related areas (compare [34]; see also [35,36]). However, and interestingly, the webpages dataset highlights that students who are the recipients of the support services at institutions of HE are not always made explicitly visible. While some HE institutions highlight their support services under the heading "Support for students with functional disabilities," others present their support services under the headings "Functional disabilities and studies" or "Studying with functional disabilities." Thus, while some mark students as belonging to a disabled category explicitly ("students *with*") others mark functional disabilities in HE per se ("*and* studies" or "studying *with*"). In the latter the students are positioned implicitly and disabilities are made salient.

Personnel working within institutions of HE (teachers, researchers, management, or administrators) are, for the most, not targeted as recipients of such support. Access issues with regards to personnel and the students are highlighted at only one of the six HE institutions in this dataset (University A). In other words, the university websites do not account for services available for personnel who are differently abled. This is an interesting finding and worth exploring in future studies with the intention of throwing light upon the role of technologies in the lives of the differently abled in work settings. (The first author (Bagga-Gupta)) has been recently awarded a large grant by the Swedish Research Council (2016–2019), whose aim is to track the life trajectories of differently abled young people in Sweden. A specific aim of the new project *Participation for all? School and post-school pathways of young people with functional disabilities*, (henceforth PAL) is to create an understanding of this groups' post-school life opportunities in societal arenas like the work place and institutions of HE [37]. Data from one of the six HE institutions explicitly highlight a list of functional disabilities (University B) and in another HE institution a demarcation is presented between gender equality (Sw: jämställdhet) and diversity equality (Sw: jämlikhet) (University A). The latter institution of HE explicates these two concepts through the following formulation: "a so-called intersectional perspective that highlights how different social categories and power relations interact and are interdependent" (All original Swedish quotations presented in footnotes have been translated by us:"så kallat intersektionellt perspektiv, som riktar uppmärksamheten mot hur olika sociala kategorier och maktordningar samverkar och är beroende av varandra") (University A).

There is a clear intentionality in what the HE institutions propose. For instance, universities declare the following: "you who are a student with functional disabilities should be able to study with other students on similar terms" ("du som student med funktionsnedsättning ska kunna studera på lika villkor som andra studenter") (University A). A normalizing position is taken as a point of departure for inclusive agendas; othering takes place in subtle ways. A tension exists in this identification process in that not all types of different abilities qualify for support. The following formulation on a university webpage highlights this issue: "You can receive support during your studies at the university if you have a functional disability that creates a problem during your studies. What support you need is contingent upon what obstacles your functional disability creates for you during your studies" ("Om du har en funktionsnedsättning som blir ett hinder i studierna kan du få stöd under din studietid på universitetet. Vilket stöd du behöver beror på vilket hinder din funktionsnedsättning innebär för dig i studierna") (University C). The issue at stake relates to access to the services themselves. While certain services are available for *all* students (for instance, talking books or a speech synthesizer), not all students can avail themselves of all the support services. Students with specific needs (at the

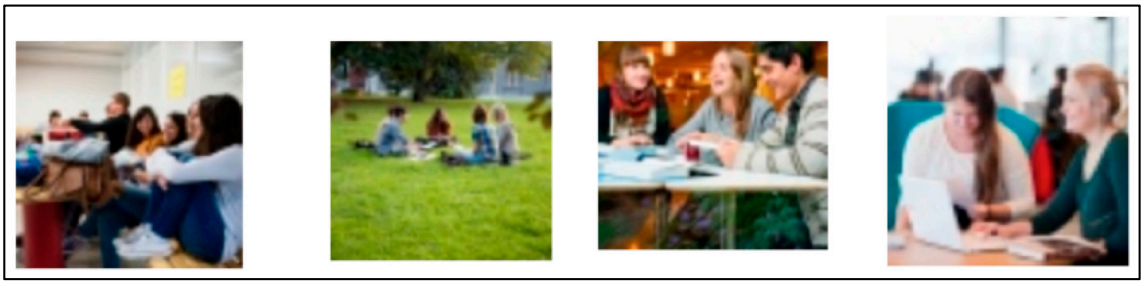
HE institutions in this dataset) are required to produce an official document signed by a professional (medical practitioner or equivalent) that clearly identifies a specific *permanent* disability. The website of one HE institution (University B) also provides external links for students so that they can avail themselves of a certificate that qualifies them for dyslexia services at the HE institution.

"You can meet coordinators at the department of student affairs at the University for a Discussion about your educational support needs. You must have a certificate about a permanent functional disability from, for instance, a medical doctor, a psychologist, or a dyslexia investigation. Take the certificate to the meeting with the coordinator. The coordinator will then write a certificate with recommended support services that you should show your contact person at your school/department" ("På Studentavdelningen på universitetet finns samordnare som du kan träffa för ett samtal om ditt behov av pedagogiskt stöd. Du måste ha ett intyg om varaktig funktionsnedsättning från till exempel en läkare, en psykolog eller en dyslexiutredning. Ta med intyget till mötet med samordnaren. Samordnaren skriver sedan ett intyg med rekommenderade stödåtgärder som du visar för din kontaktperson på institutionen") (University E). Students are also cautioned with the following italicized text: "*You are not covered by this support if you only have a temporary handicap or disability. If you have a temporary handicap or disability and need support, you should turn to your study counsellor at your school/department*" ("Har du en tillfällig skada eller sjukdom så omfattas du inte av det här stödet. Behöver du tillfälligt stöd ska du istället vända dig till studievägledaren på din institutionen") (University C). Thus temporary and permanent functional abilities receive different types of support services at HE institutions in Sweden. Such institutional arrangements in themselves (co)construct identity positions for the supported students.

Other dimensions related to the identification of differently positioned students (or personnel) that make visible (but also invisible) group identity positions emerge in the analysis. For instance, as Figure 1 illustrates, general diffuse pictures—in tandem with technology—are presented on HE support services' webpages. While the text that is presented on the page (close to Figure 1) targets students with functional disabilities, the picture in itself highlights knowledge (the books), which is symbolically framed and kept in place by a pair of technological devices (headphones). The text that accompanies this picture does not clarify whether this represents a cognitive view of knowledge or more simply constitutes a symbol for reading books or something else: "You who are a student and have a reading disorder on account of dyslexia, visual disability, or other functional disability have the right to download talking books" ("Du som är student och har en läsnedsättning på grund av dyslexi, synskada eller annan funktionsnedsättning har rätt att ladda ner talböcker") (University D).

Figure 1. Technological support for whom?

Another dimension that emerges from the analysis of the representation of young adults targeted for support in various spaces inside and outside HE classrooms is the invisibility of disability markers. Figure 2a,b illustrate this issue in sets of pictorial representations on the support services' webpages of HE institutions in our dataset.



(**a**)

(**b**)

Figure 2. (**a**) Support services for *all* students? (**b**) Support services for all students?

No specific functionality related to abilities (or lack thereof) that the services support can be discerned in the pictures in Figure 2a,b. These pictures display mainstream common practices within HE institutions in Sweden: sitting in a lecture space, working on a PC, social activities, etc. No semiotic resources mark the students (or individuals) in the pictures as differently abled. The textual information next to these pictures, however, highlights the kind of support services that are offered within HE and this indirectly defines the kind of special needs and support services that specific students can access during their studies.

Another dimension relates to how specific technological support services are highlighted, including the flagging of the fact that the services are difficult to procure. For instance, talking books are made available by a couple of HE institutions in the dataset, with the coupled warning that they take a long time to produce, or that deaf and hard-of-hearing students are entitled to SSL interpreters, but that "there is a big shortage of them" (University D).

The issues mentioned so far can also be scrutinized from the vantage point of Jonny's and Olle's experiences of support services at the institutions of HE where they have been members. Olle's access to SSL–Swedish interpreters during his studies at two universities differed substantially: while he had access to a pool of interpreters employed by one university, his access to communication at lectures and seminars at the second HE institution was strictly regulated by careful planning of courses in a string of administrative meetings with university support staff. Two issues are significant here. The support staff at both universities where Olle has studied are not users of SSL. This means that interpreters are required to process and plan Olle's HE studies. Here it is Olle's disability that is marked, not the support staff's lack of abilities to use and communicate in SSL. The onus is on the differently abled student to identify his or her disabilities, apply for support, and plan his or her studies—and all this well in advance.

A second issue relates to the formalistic nature of support that is made available at universities and the complex, fluid nature of education at the HE level. For instance, Jonny has access to course literature

in the form of digitized talking books, but his experience of the support services administration, including the format in which the talking books are made available to him (CDs rather than digital files) creates issues of accessibility. Jonny's blindness means that physical CDs are not easy to sort out and identify. He, early in his student career, identified external resource persons (two blind staff at a national agency) whom he regularly approaches and who promptly process his course literature into digitized files via the Internet—a format and routine that provide him access to materials in an easy and reliable manner. This type of mismatch between the needs of students within HE and the services that are provided can also be noted in the issues that Olle experienced, particularly before and after lectures and seminars and during the pauses between them. Access to SSL interpreters was made available during the formal lecture and seminar slots through interpreters who were present physically. Olle did not have access to interpreters during coffee breaks and lunch slots between lectures and seminars and often ate or sat alone, while the rest of his classmates sat together. Here digitally mediated interpretation services via, for instance, video phones (Sw: bild-telefoni; see [38–40]) or interpreter-in-the-pocket (Sw: tolk-i-fickan) services are not available, nor are they considered viable options that could support accessibility.

Differently abled students appear to be left to their own devices to participate in HE through access that is organized from an *institutional functionally-abled vantage point*. While note-taking facilities feature among the list of services provided by the majority of HE institutions in our dataset, neither Jonny nor Olle had access to this support during their HE studies at four different university campuses in the nation-state of Sweden. This constitutes an important dimension of *access-in-policy* that does not necessarily translate to *access-in-everyday-life* for Jonny and Olle.

4.2. Range of Services and Support Provided by HE Institutions

A rich and complex picture of a range of support services emerges from the analysis of the university websites, enhanced by the in-depth analysis of the two case studies. HE institutions in Sweden in the 21st century offer students in general, and students with functional disabilities in particular, a large range of support services. However, as we have already seen (and will see further), this support is steered top-down, gets regulated in various ways, and is not always available for differently abled students. General support for students is presented in the webpages dataset based upon the Swedish Discrimination Law. For instance, the following is a formulation that is similarly framed at the six HE institutions in our webpages dataset: "The university's work for equality means that no one will be discriminated or should need to experience mistreatment on the grounds of gender, gender identity, and/or gender expression, ethnic allegiance, religion or faith, functional disability, sexual orientation, or age. This is regulated in the Discrimination Law" ("Universitets arbete för lika villkor innebär att ingen ska bli diskriminerad eller behöva uppleva sig trakasserad på grund av kön, könsidentitet och/eller köns uttryck, etnisk tillhörighet, religion eller annan trosuppfattning, funktionsnedsättning, sexuell läggning eller ålder. Detta regleras i Diskrimineringslagen") (University C). All the institutions in this dataset have local regulations that operationalize the national law. We can note here that while support for students with disabilities is spelled out explicitly, other student categories are described in general terms (if at all). One university differentiates support for students up to the Master's level and those who are pursuing doctoral studies (University C). Furthermore, two universities in the dataset explicate a policy for students who have young children.

Technologies currently play a key role in both the dissemination of information vis-à-vis the available support (via internet pages, university digital platforms, etc.) and the digital nature of a large part of the support that is made available. Table 1 presents an overview of the primary types of institutional support and services that are made available for differently abled students at universities in terms of different types of assistive and disruptive technologies. The types and dimensions of assistive and disruptive services are, here, discussed in terms of human technologies, digital technologies, analogue technologies, physical/spatial technologies, mobility technologies, and temporal technologies (compare above and [39,40]). Human technologies include a range of

support services that are delivered by an individual who assists students with a variety of tasks. Digital technologies include software and hardware that students can either access or download onto their own computers. These technologies are also available at university campuses in specially designated spaces like reading studios or computer rooms. Analogue technologies consist primarily of hard copies of course literature translated into Braille. The physical rooms on campuses where students can potentially avail themselves of software and hardware are here framed in terms of spatial technologies, while mobility technologies include GPS and wheel chairs. Finally, temporal aspects of extension of time for examinations or extra time for supervision where SSL interpreters are deployed are here included within temporal technologies. While boundaries between the identified support (i.e., human, analogue, and digital) cannot be seen as fixed and demarcated, the typology that has emerged (and is presented in Table 1) allows us to understand the ways in which support and assistance get framed. Such a typology also illustrates how HE institutions account for their support and services (middle column). This includes the framing of support as something that needs to be clearly presented and delivered; this does not necessarily point to the specific target groups related to the kind of technology or assistance that is made available. Table 1 also juxtaposes Jonny's and Olle's accounts of the types of support services they have made use of during their studies at different universities (right-hand column).

Table 1. Typology of range of institutional support and services, as accounted for in the webpages and case studies datasets.

Typology of Support & Services	Examples of Institutional Accounts of Support & Services	Jonny's & Olle's Accounts of Support & Service Use
Human support	Note taking, Thesis supervision, Mentor support, Student/colleague support, Writing interpreter, SSL interpreter, Language supervision, Assistant	SSL–Swedish interpreters, some assistance support (initially)
Digital support	Course literature (talking books) by MTM (Myndigheten för Tillängliga Medier) (Authority for accessible media), Speech synthesizer, Spelling programs (available both online and in the reading studios on Campus), Hearing Loop, Microphones, Reading television (Sw: läs-tv), also called enlarging camera (Sw: förstoringskamera)	Course literature
Analogue support	Course literature (Braille) by MTM (Myndigheten för Tillängliga Medier) (Authority for accessible media)	Course literature
Physical/spatial support	Reading studio or resource room (on campus), Spelling programs (available both online and in the reading studios/resource rooms on Campus), Rest room (on Campus), Support for studies abroad, Lecture halls, Height adjustable working tables	
Mobility support	Maps on smartphones, Wheelchairs, Digitized maps	
Temporal support	Examination (extended time), Extended time for supervision when SSL interpreters are engaged, Extended time for library loans, Adapted economic support (for extended time periods)	

Figure 3 illustrates the organization of support technologies in a reading studio or resource room at a university in the dataset. The digital support and spatial/physical support here includes a printer, scanner, computer, screen, enlarging camera, CD writer/reader, etc. The information regarding such digital and spatial support is not augmented by information on how (or whether) the studios/rooms are used by specific groups of students. Jonny and Olle report that they have never made use of such spatial arrangements at their universities. This raises another dimension related to access issues:

technologies that are made available at HE institutions are not used by students who are differently abled in our dataset. The webpages do not (as we have already seen) always specify the kinds of functional abilities or the specific groups that are targeted for the support.

Figure 3. Technology-rich reading studio at University F.

Students are expected to be aware of their needs as well as the type(s) of support that they can access. This information is made available digitally. Many HE institutions clearly highlight that students with functional disabilities need to take substantial responsibility for their participation in HE. Such information, targeted towards differently abled students, is generally made available under headings like "What can you do yourself?" This is formulated by (three) HE institutions as follows: "Your capacity to take your own responsibility and to formulate your needs in the study situation constitutes an important characteristic for you to succeed in your studies" ("Din förmåga att ta eget ansvar och att formulera dina behov i studiesituationen är en viktig egenskap för att du ska lyckas i dina studier".) (University D). Students are explicitly requested to get in touch with the institution well in advance. For instance, the following is presented under the title "Make contact well in advance" on the first page that is titled "studying with disabilities": "If you have special needs, *you should get in contact* with the university coordinator for students with functional disabilities, when you register yourself for studying at our university. *You should also*, well ahead of the start of your studies, *get in touch* with the school/department where you plan to study, in order to plan your studies with the study counsellors and teachers" ("Universitetet har en samordnare för studenter med funktionsnedsättning, som *du bör ta kontakt* med i samband med anmälan till studier om du är i behov av särskilt stöd. *Du bör också* i god tid före studiestarten *kontakta* den institution där du tänker studera, för att planera dina studier tillsammans med studievägledare och lärare") (University F, emphasis added). These types of formulations highlight that the future student is encouraged to get in touch with the person or department in charge of "students with disabilities" in order to set up a study plan with the teachers and other supervisors at the department where the student has been enrolled. The modal verb "should" (Sw: bör) indexes a locus of responsibility related to the imperative in the title (do it). The text addresses future students rather than those who are already registered and are studying at the university. Being sighted or visually abled is a precondition for accessing such a digital webpage. Visually impaired people cannot reach the link unless they receive assistance from another person who is visually abled or from software tools that can convert textual semiotic resources to speech.

Jonny and Olle are technology-savvy and repeatedly stated in their discussions with us that technology frees them from the constraints of dependency on functionally abled human beings in different situations inside and outside HE settings:

- "Correct technologies are much more valuable as compared to an assistant" (Jonny, 2014).
- "Technology makes me independent and equal to seeing people" (Jonny, 2015).

- "Technology like 3G and the Internet have revolutionized my life. This is particularly true in my private life" (Olle, 2014).

The support coordinators that Jonny and Olle have had (at the four universities where they have been students) have been supportive to different degrees. The type of support that the coordinators have provided have included: reading information aloud (for Jonny) from websites, from notice boards, or from printed pamphlets; making contact with a second university where Jonny was going to transfer; explaining the physical layout of the campus; contacting the interpretation services; ringing the study coordinators or teachers at the school/department where Jonny or Olle were studying; identifying where one could get one's log-in information in order to access relevant home pages, the intranet, student e-mails, etc. Jonny and Olle turned to us researchers for similar support both during and after our project fieldwork period. Jonny's and Olle's parents have also made physical trips to the university campuses to discuss their grown-up children's study situation.

4.3. Making Use of Support and Services during HE Studies

As the analysis so far highlights, differently abled students are required to be very active and creative (as compared to the situation for functionally abled students) in order to access services and participate in their own HE. Some of the salient issues highlighted in the analysis presented so far, and of relevance for the third overarching theme that has emerged in this study, include the following: (i) differently abled students need to be competent in knowing and assessing the degree of their own functional abilities; (ii) these students are held responsible for providing a document that certifies their status as disabled and as being in need of specific support; and (iii) these students are held responsible for identifying the correct assistance and contacting their institution of HE well in advance. Furthermore, Jonny and Olle did not appear to make much use of digital/analogue, physical/spatial/mobility, or temporal technologies that are available at the four universities where they have studied (see Table 1). As highlighted under the previous analytical theme, students have the opportunity to download some software (e.g., speech synthesizer) themselves and store such resources on their computers. Human support (what Holmström & Bagga-Gupta [40] call "communicative-link" technologies) is, on the other hand, something Jonny and Olle regularly use. Jonny reports that he uses two specific ICT tools extensively in his everyday life inside as well as outside the university—iPhone 5 and Pronto (Pronto is an advanced note-taking tool that has a range of digital features e.g., a calendar, Internet, talking books, music streaming, etc.). Neither of these is provided to him by the HE institutions where he has studied. Olle makes use of an Android smartphone as well as an iPad extensively in his everyday life inside and outside the university (including his workplace). Neither of these technologies was provided to him by the two universities he studied at or by his current employer. Knowledge about what one requires, irrespective of a student's level of functionality, shapes participation in HE. Here issues of accessibility, participation, and interaction are significant in that they potentially enable (and disable) students' possibilities to succeed with their studies [41].

Human support plays a decisive role for Jonny—both as far as his studies are concerned and in his private life. For instance, Jonny turns to two blind personnel at an authority outside the university support system when he requires assistance (e.g., to get his course literature accessible as digitized speech files) and socializes with his previous assistants during his free time. Olle requires interpreters not only in order to access the oral communication during lectures and seminars, but also to plan his studies with the university support staff. Both Jonny and Olle turn to their parents for assistance (and, during and after our fieldwork, also to us) to negotiate services with the university support staff. This implies that accessing the support at universities is not a straightforward process for differently abled students and, furthermore, they do not make use of all the support services provided. For instance, and as has been noted above, neither Jonny nor Olle made use of physical/spatial technologies at their universities. The following issues can also be raised given the mismatch that has been noted between the support services that institutions of HE account for and the non-use of these by Jonny and Olle: Can differently abled students access digital and other tools and technologies during

their lectures and seminars or are they required to leave their mainstream classroom settings in order to make use of the support services that are provided? What mobile technological tools do (they have access to within HE (for instance, interpreter-in-the-pocket)? Are differently abled students given opportunities to discuss and present feedback regarding their experiences of inclusion/exclusion and technologies or tools they consider appropriate for their needs during the course of their HE studies? Jonny and Olle, for instance, report that their preferences for support technologies were never solicited during their HE studies. Some of the technologies (smartphones, Pronto, etc.) that Jonny and Olle use extensively in order to participate in the institutional life of HE were not made available to them by their universities. While smartphones constitute regular tools that all students use inside and outside their studies at HE institutions in Sweden, these tools play a crucial function in Jonny's and Olle's lives. Technologies like Pronto are specific tools that support the lives of people who are functionally different. The types of issues raised from our analysis under this theme constitute dimensions that require further scrutiny. (We intend to follow up the findings from this study in our new Swedish Research Council project PAL, *"Participation for all? School and post-school pathways for young adults with functional disabilities"* (2016–2019; www.ju.se/ccd/pal).)

4.4. Support for Accessing Support and Issues of Stigma

Technologies, including ICT, are commonly accounted for in the webpages dataset in terms of a facilitator for information and *access to content*. There seems to be a dual approach to how technologies are offered by the HE institutions as support: it is, as we have seen above, made available inside physical spaces (like resource rooms or reading studios), and it is also made available online, via the students' university logins. While Jonny and Olle access information and content in a number of different ways (via websites, personal contacts, interpreters, previous assistants), their primary interaction with technologies relates to navigation (mobility, for instance), as well as communication with others (e.g., through the deployment of 3G or 4G, chat, mails, sms, etc.), for instance, students, teachers, assistants, interpreters, and us researchers.

Differently abled students' positions as university students are framed in terms of *alternative paths of participation* in the activities of their university communities. These communities are located both online and offline and accessibility/participation comprises both physical and digital concerns. For instance, this is framed in HE institutions as follows:

Physical issue: "At University E we work towards making our physical spaces accessible" ("Vid University E arbetar vi för att lokalerna ska vara tillgängliga").

Digital issue: "Contact the university library if you need your course literature as talking books. There you will get assistance to apply for a downloadable account with the Authority for accessible media (MTM). You can download and read your talking books in the format that is suitable for you—on the computer, on your mobile or iPad—when you receive your account details" ("Behöver du din kurslitteratur som talbok, vänd dig till universitetsbiblioteket. Där får du hjälp med att ansöka om ett nedladdningskonto hos Myndigheten för tillgängliga medier (MTM). När du fått dina inloggningsuppgifter kan du själv ladda ned och läsa talböcker på det sätt som passar dig bäst: i datorn, mobilen och läsplattan") (University E).

A mismatch between differently abled students' use of technologies to access, navigate, and participate in HE institutions on the one hand, and the support services offered at universities on the other, can be understood in terms of a policy driven *9-to-5 institutional view* of support services. A 9-to-5 view can be illustrated by interpreter support that is scheduled for deaf students during lectures and seminars and the absence of similar support for deaf students during lunch and other breaks. Another example of a 9-to-5 institutional view of support services that does not always match students' needs can be illustrated by institutional work schedules. For instance, a disability coordinator suggested one late spring that issues that Jonny was facing vis-à-vis his studies could be resolved by the new coordinator who was going to replace her after the summer break, i.e., in early autumn. Furthermore, support for differently abled students seems to be non-existent if and when they participate in distance

courses, that is, when they study in online asynchronous or synchronous courses. These examples together highlight both the mismatch between services and students' support needs and the HE institutions' clear message that students must take responsibility for their own studies.

Jonny and Olle spent a large part of their time at university trying to keep up to date with regards to the administration pertaining to their studies. Changes in lecture venues or seminar timetables, or changes in assignments or last-minute additions to reading materials presented significant challenges for them. Some faculty members seemed surprised when they were notified that Jonny or Olle missed information that had been previously presented. A faculty member expressed surprise (to us) when he learned that Jonny had missed important information related to a re-scheduling of a seminar; this faculty member (who is aware of the fact that Jonny is blind), informed us: "I actually remember writing the information on the white board during the last seminar!" Such examples illustrate the gap between well-meaning intentions of staff, institutions, and policies and the complex situation of students who are differently abled [30].

The types of issues highlighted above have also been identified in the research literature. For instance, Phillips et al. [41] have focused upon faculty experiences of providing online courses in relation to the kinds of accommodations (or non- or problematic accommodations) that are made for differently abled students. Their findings highlight that faculty are generally unaware of how they should accommodate their online teaching to the situation of differently abled students. An implication of such findings is that there is a need for clarity and more finely tuned *support for supporting faculty* in their online instructional work and to encourage differently abled students to discuss accommodation needs early during their studies. Phillips et al. [41] also discuss this issue in relation to the degree of comfort students feel when they are required to include themselves in what can be framed as a *stigmatised position* of "students with disabilities." The issue of stigmatization is also raised by Trammel [42] and Martin [43]. A literature review presented by Trammel highlights differently abled students' needs in different contexts:

"The semantics of disability actually constitute the primary battleground for equal access in both Western and non-Western countries. Since cultural definitions remain the predominant variable within the social model of disability, the language used to debate disability constitutes the forum where social otherness and understanding are actually negotiated. Because the word 'disability' itself is so charged with manifold meanings and threatening stereotypes, requiring students to visit an 'Office for Disability Support' as a first step in getting accommodations forces a preliminary label on them before the accommodation process can even begin to unfold" [42] (p. 24).

Both Jonny and Olle seem to be acutely aware of the double-edged sword related to accessing institutional support that enables their participation in the world of HE. They often articulate their dissatisfaction with various dimensions of the support that is provided but also highlight how technologies make them equal to the functionally abled students they have studied with.

5. A Higher Education for All? Overarching Reflections

Integration, inclusion, and equity constitute fundamental dimensions of democracy in post-World War II societies and their institutions. The themes that we have identified through the juxtaposition of analysis of ethnographically framed materials in the study presented in this paper make visible the work that institutions and their members do. The analysis has included the organization of time and space and the use of a range of technologies in the institutional settings of HE against the backdrop of institutions' and individuals' accountings of support services that are provided and deployed in such settings.

The analysis of the webpages dataset shows the ways in which access and its relationship to functional abilities are framed. In other words, the resources that HE institutions account for illustrate intentions from a national and local regulatory perspective (i.e., the Swedish Discrimination Law and local policy documents that universities report they follow). This contrasts with what appears to be relevant for specific student populations, an issue illustrated through our case study dataset of

two differently abled students—Jonny and Olle. The issue of individual responsibility and commitment to one's own inclusion—an issue that has emerged in this study—constitutes a theme that is emerging in the research literature. This is salient specifically in relation to the proactive focus that is deemed necessary in order to include all students; this takes its point of departure in the needs of individuals, rather than general regulations and policies. This issue is central during the transition from high school to higher education. All prospective students cannot access the information offered via online resources in a straightforward manner, since webpages do not always highlight specific access points for a particular functional dis/ability. For instance, Jonny (initially at least) has relied on personal contacts to ascertain *where* to access digital information vis-à-vis the support services offered by the universities where he studied. A counterpoint here is the availability of *general* information regarding HE in SSL on some university webpages; interestingly, though, the specific support information for deaf or hard-of-hearing students is *not* made available in SSL. This means that an inability to see, hear, or read becomes a stumbling block in the attempt to access entry points to relevant information regarding support services. Thus students who are blind or deaf or have reading challenges *need support to reach the support* that is made available for them within the context of HE. Horst and Miller [44] frame these types of issues in terms of the incapability of society to offer technologies that meet the needs of differently abled people, or how "the battles that were fought for ramps, elevators, Braille signage and visual signal for the hearing impaired, to name a few [. . .] are now being *extended to the digital media world*" [44] (p. 103, our emphasis).

Life-long learning is seen as a key dimension in the education for all movement [34]. Until high school level, Jonny and Olle were provided with support services in mainstream (Jonny) and segregated (Olle) schools. While support is abundant in institutional segregated settings until the high school level, ethnographically framed research suggests that differently abled pupils in these mainstream school settings need to be active and creative in order to participate in educational activities [9,13]. Within HE, too, as our analysis in this paper indicates, support for differently abled students requires that the latter are active and responsible for their own access to participation. In other words, a central tension that has emerged in this multi-scalar analysis relates to the communicative and navigatory support that technologies enable for differently abled students on the one hand, and the support services regulated and accounted for by society generally and by institutions like HE in particular on the other hand. Our analysis of the case study dataset illustrates that Jonny and Olle have (different) advanced competencies and experiences that are relevant for navigating a range of sophisticated technologies, for instance, accessing information, getting work done, finding their way across physical spaces, etc. This is in stark contrast to both the enormous institutional support they have received up to the high school level and the technologically infused (ir)relevant and difficult-to-access support that their universities make available for students like them. The latter appears to be structured by a normalizing agenda where the focus is on solving problems of inclusion (in universalistic terms).

Individuals who are differently abled are accorded marginal positions in the planning of support services that are made available for them. Furthermore, input from them (regarding their experiences) is not solicited during the course of their university studies. There exists a risk that support therefore gets reduced to a *display of a policy of inclusion*. Support thus seems to be disconnected from the world of the target group that it aims to support within HE institutions (in Sweden). Some of our previous and more recent meta-analysis of peer-reviewed research literature has covered a wide range of different functionalities including issues related to mobility and sensory and learning disabilities [45–48]. The primary focus in the literature consulted for one of our ongoing meta-analysis that covers the period 2005–2015 is on the types of support provided to differently abled students and staff within HE institutions [48]. The preliminary analysis of this ongoing work suggests that specific disabilities and their relationships to accessibility issues are not focused on or discussed in recent scholarship. While this take-home message is important, the point that we wish to emphasize here is the near total absence of scholarship in which differently abled students' and personnel's participation and use of technologies are studied in situ across time and space in HE institutional settings. This means,

among other things, that research where individuals or institutions account for different dimensions (for instance, in interview- or survey-based studies) clearly dominates this area of knowledge production. In other words, there is a domination of narrative accounts and survey studies that explicitly aims to improve the situation of differently abled students within HE. There exists a paucity of scholarship that takes a socially oriented position as a point of departure (see Section 2 above).

Our intensive interviews with Jonny and Olle also constitute data with a narrative dimension. From a performative, socially oriented analytical position, and in line with what we have argued in Section 2, this type of data has specific limitations. Our case study materials comprise, in addition to interviews, a larger range of data. Bringing this data into conversation with the analysis of the webpages dataset has been deemed necessary in order to make a more general claim about HE policies of inclusion in relation to technology or individuals' experiences of university support provision. This paper thus throws light upon (i) the ways in which individuals and institutions *together* account for the roles that technologies, including ICT, play in enabling (or disabling) inclusion, transitions, and participation for learning in HE; as well as (ii) the in situ nature of how these processes play out in everyday life situations. The study thus builds upon a multi-scalar approach that includes drawing upon an ethnographic tradition for generating a variety of data that have been juxtaposed and analysed in parallel. The creation and parallel analysis of two datasets has allowed for the emergence of key themes and it has been possible to make visible some complex dimensions of participation of differently abled students and the role that technology plays in their lives inside (and also outside) HE settings.

Furthermore, the study presented in this paper adds a critical dimension to the investigation of the role that technologies, including ICT, play in higher education for individuals who are differently abled and who *constitute a variation on a continuum of capabilities*. This is particularly the case with regards to issues of identity work and accessibility to institutionally framed activities in HE settings. For example, our analysis shows how institutional agendas are significant dimensions of identity work. Metaphorically, one could say that while Jonny and Olle live 24/7 lives as students within HE, institutional support services at universities build upon a 9-to-5 temporal framework. Thus, the analysis of the webpages dataset shows that while laws and regulations regarding institutional responsibilities are implemented within HE, there exists a tension in that differently abled university students must shoulder significant responsibility for their own inclusion within HE. Similarly, the analysis of the case studies highlights a tension between the support offered to differently abled students by institutions of HE as compared to their everyday lives and languaging, i.e., what transpires in the classroom, among students and instructors. For instance, there exists a general understanding of what an individual who is blind is able to do when it comes to understanding instructions and assignments. A blind individual can understand oral instructions but is unable to visually access, i.e., read the instructions that a teacher writes on the classroom whiteboard. The analysis of the case studies furthermore highlights the fact that differently abled students regularly engage their able-bodied relatives and acquaintances (and us) in order to make their voices heard. Such complexities need to be made visible, as well as studied further. This could include, for instance, engaging members from differently abled students in de facto networks during ethnographic fieldwork, with the intention of contributing to a more nuanced and in-depth understanding of differently abled members' life spheres and trajectories in Sweden (and elsewhere) in the 21st century. Given that transitions to adulthood (at least in Sweden) necessitate a break from support that was previously forthcoming from parents, this issue has wider implications for differently abled young people's position in society.

Such issues can be contrasted with the shift in trajectories and transitions vis-à-vis the support that society provides for differently abled pupils up to the high school level. Once they reach HE, students like Jonny and Olle need to navigate the institutional information that is provided primarily in written form—both digitally and in analogue texts, rather than in modalities such as Braille and SSL. Paradoxically, then, there exist *important gaps* in how routine information is made available to students. At the same time, universities have high expectations of differently abled students, requiring them to

take responsibility for their own inclusion in institutional settings. The formal routines of HE reinforce categorical labels, and not only cement a disability-framed Othering discourse, but also stigmatize differently abled students (see also [40]). Differently abled students are furthermore required to provide proof of the *permanent* nature of their disability in order to access any type of support. One can also ask why these high expectations made of functionally disabled students are not the same for *all* students. Such a line of thought builds on the premise that a well-planned course, with lecture slides provided in advance and/or afterwards, accessibility of content through several modalities, clarity in the explanations/instructions, etc. is key within HE for *all* courses for *all* students, independent of their position on a continuum of functional ability. It thus, we argue, becomes relevant to put the spotlight on the nature of disabling and enabling technologies for learning (rather than on differently abled individuals) in higher education that claims and aims to be inclusive. Students who agree to take advantage of these support services become automatically stigmatized and thereby marginalized. The study presented in this paper highlights the need for an educational culture that increases openness and accessibility for *all* students irrespective of their position on an ability continuum across time and space. Design guidelines envisaged to open up education for all students, rather than for specific groups, could be a viable strategy for policy planning within HE.

Author Contributions: Sangeeta Bagga-Gupta conceived and designed the fieldwork in the different projects from which data have been drawn for analysis in this paper. She conducted fieldwork for all the projects. In project JC, she closely collaborated with Ylva Winther during the two phases of the project. Sangeeta Bagga-Gupta also conceived of and designed the work division and the organization of the study presented in this paper. This was done in close collaboration with Giulia Messina Dahlberg and Ylva Winther. Each author participated in the analysis, both of the separate datasets as well as in joint data sessions. While Sangeeta Bagga-Gupta had overall responsibility for the writing of this study, all three authors contributed drafts that emerged from the analysis. Sangeeta Bagga-Gupta, Giulia Messina Dahlberg, and Ylva Winther were responsible for generating the webpages dataset used in this study. All three authors contributed substantially to the work reported in this study.

Conflicts of Interest: The authors declare no conflict of interest.

Abbreviations

The following abbreviations are used in this manuscript:

CI	Cochlear Implants
GPS	Global Positions System
HE	Higher Education
ICT	Information and Communication Technologies
LMS	Learning Management System
MOOC	Massive Online Open Course
MTM	Myndighet för Tillängliga Medier (Authority for accessible media)
OER	Open Educational Resources
SSL	Swedish Sign Language
WAI	Web Accessibility Initiative
W3C	World Wide Web Consortium

References

1. White, S.R.; Ingstad, B. (Eds.) *Disability in Local and Global Worlds*; University of California Press: Berkeley, CA, USA, 2007.
2. Bagga-Gupta, S. Languaging: Ways-of-being-with-words across Disciplinary Boundaries and Empirical Sites. In *Language Contacts at the Crossroads of Disciplines*; Paulasto, H., Riionheimo, H., Meriläinen, L., Kok, M., Eds.; Cambridge Scholars Publishing: Newcastle upon Tyne, UK, 2014; pp. 89–130.
3. Lankshear, C.; Knobel, M. *New Literacies: Everyday Practices and Social Learning*; Open University Press: New York, NY, USA, 2011.
4. Buckingham Shum, S.; Ferguson, R. Social Learning Analytics. *Educ. Technol. Soc.* **2012**, *15*, 3–26.
5. Messina Dahlberg, G. Languaging in virtual learning sites: Studies of online encounters in the language-focused virtual classroom. In *Örebro Studies in Education*; Örebro University: Örebro, Sweden, 2015; Volume 49.

6. Haythornthwaite, C.; Kazmer, M.M. *Learning, Culture and Community in Online Education: Research and Practice*; Peter Lang: New York, NY, USA, 2004.
7. Bagga-Gupta, S. Visually oriented bilingualism. Discursive and technological resources in Swedish Deaf pedagogical arenas. In *The Sociolinguistics in Deaf Communities Series*; Lucas, C., Herreweghe, V., Vermeerbergen, M., Eds.; Gallaudet University Press: Washington, DC, USA, 2004; Volume 10, pp. 171–207.
8. Holmström, I.; Bagga-Gupta, S. "Va sa han?" Technologies and Participation Strategies in Mainstream School Settings. In *Marginalization Processes. Studies of Membership and Participation Across Disciplines and Sites*; Bagga-Gupta, S., Ed.; Cambridge Scholars Publishing: Newcastle upon Tyne, UK, 2016.
9. Holmström, I.; Bagga-Gupta, S.; Jonsson, R. Communicating and hand(ling) technologies. Everyday life in educational settings where pupils with cochlear implants are mainstreamed. *J. Linguist. Anthropol.* **2015**, *25*, 256–284. [CrossRef]
10. Bagga-Gupta, S. Privileging identity positions and multimodal communication in textual practices. Intersectionality and the (re)negotation of boundaries. In *Literacy Practices in Transition: Perspectives from the Nordic Countries*; Pitkänen Huhta, A., Holm, L., Eds.; Multilingual Matters: Bristol, UK, 2012; pp. 75–100.
11. Winther, Y. Vardagsliv i Och utanför Klassrummet. En Explorative Studie om Hur Man Görs till Blind i Skolan. Master's Thesis, Linköping University, Linköping, Sweden, 2000. (In Swedish)
12. Winther, Y.; Bagga-Gupta, S. The "acquisition" of blindness in communicative spaces. In Proceedings of the 12th Biennial Conference of European Association for Research on Learning and Instruction (EARLI), Budapest, Hungary, 28 August–1 September 2007.
13. Bagga-Gupta, S.; Holmström, I. Language, Identity and Technologies in classrooms for the differently-abled. *Commun. Disord. Deaf Stud. Hear. Aids* **2015**, *3*, 1–19. [CrossRef]
14. Garcia, O. Languaging and Ethnifying. In *Handbook of Language and Ethnic Identity*; Fishman, A., Garcia, O., Eds.; Oxford University Press: New York, NY, USA, 2010; pp. 519–534.
15. Butler, J. *Gender Trouble: Feminism and the Subversion of Identity*; Routledge: New York, NY, USA, 1990.
16. Bagga-Gupta, S.; Hansen, A.L.; Feilberg, J. (Eds.) *Identity Revisited and Reimagined. Empirical and Theoretical Contributions on Embodied Communication across Time and Space*; Springer: Rotterdam, The Netherlands, 2016; in press.
17. Lave, J.; Wenger, E. *Situated Learning: Legitimate Peripheral Participation*; Cambridge University Press: Cambridge, UK, 1991.
18. Säljö, R. Digital tools and challenges to institutional traditions of learning: Technologies, social memory and the performative nature of learning. *J. Comput. Assist. Learn.* **2010**, *26*, 53–64. [CrossRef]
19. Vygotsky, L.S. *Mind in Society: The Development of Higher Psychological Processes*; Harvard University Press: Cambridge, MA, USA, 1978.
20. Wertsch, J.V. *Mind as Action*; Oxford University Press: Oxford, UK, 1998.
21. Bakhtin, M. *Speech Genres & Other Late Essays*; Emerson, C., Holquist, M., Eds.; University of Texas Press: Austen, TX, USA, 1986.
22. Linell, P. *Rethinking Language, Mind and World Dialogically: Interactional and Contextual Theories of Human Sense-Making*; Information Age Publishing: Charlotte, NC, USA, 2009.
23. Säljö, R. *Lärande—En Introduktion till Perspektiv och Metaforer*; Gleerups: Malmö, Sweden, 2015. (In Swedish)
24. Antaki, C.; Widdicombe, S. (Eds.) *Identities in Talk*; Sage: London, UK, 1998.
25. Bagga-Gupta, S. Performing and accounting language and identity: Agency as actors-in-(inter)action-with-tools. In *Theorizing and Analyzing Agency in Second Language Learning: Interdisciplinary Approaches*; Deters, P., Gao, X., Miller, E., Vitanova-Haralampiev, G., Eds.; Multilingual Matters: Bristol, UK, 2014; pp. 113–132.
26. Tapio, E. A Nexus Analysis of English in the Everyday Life of FinSL Signers: A Multimodal View on Interaction. Ph.D. Thesis, Jyväskylä University, Jyväskylä, Finland, 2013.
27. Leander, K.; Philips, N.C.; Taylor, H. The Changing Social Spaces of Learning: Mapping New Mobilities. *Rev. Res. Educ.* **2010**, *34*, 329–394. [CrossRef]
28. Ajagán-Lester, L. "De Andra": Afrikaner i Svenska Pedagogiska Texter (1768–1965). Ph.D. Thesis, Stockholm University, Stockholm, Sweden, 2000. (In Swedish)
29. Leigh, I.W.; Maxwell-McCaw, D. Cochlear Implants: Implications for Deaf Identities. In *Cochlear Implants, Evolving Perspectives*; Paludneviciene, R., Leigh, W.I., Eds.; Gallaudet University Press: Washington, DC, USA, 2011; pp. 95–110.

30. Faubion, J.D.; Marcus, G.E. *Fieldwork Is Not What It Used to Be: Learning Anthropololgy's Methods in a Time of Transition*; Cornwell University Press: Ithaca, NY, USA, 2009.
31. Bagga-Gupta, S. Center-staging language and identity research from earthrise perspectives. Contextualizing performances in open spaces. In *Identity Revisited and Reimagined. Empirical and Theoretical Contributions on Embodied Communication across Time and Space*; Bagga-Gupta, S., Hansen, A.L., Feilberg, J., Eds.; Springer: Rotterdam, The Netherlands, 2016; Chapter 4, in press.
32. Goffman, E. *Encounters: Two Studies in the Sociology of Interaction*; Bobbs-Merrill: Indianapolis, IN, USA, 1961.
33. Becker, H.S. *Outsiders: Studies in the Sociology of Deviance*; The Free Press: New York, NY, USA, 1963.
34. Hjörne, E.; Säljö, R. *Att Platsa i en Skola för Alla: Elevhälsa och Förhandling om Normalitet i den Svenska Skolan*; Norstedts Akademiska Förlag: Stockholm, Sweden, 2008. (In Swedish)
35. Bagga-Gupta, S. A common education-for-all and life-long learning?: Reflections on inclusion, equity and integration. In *Theory and Methodology in International Comparative Classroom Studies*; Hansen, B., Ed.; Høyskoleforlaget: Kristiansand, Norway, 2014; Volume 2.
36. Bagga-Gupta, S.; Feilberg, J.; Hansen, A.L. Many-ways-of-being across sites. Identity as (inter)action. In *Identity Revisited and Reimagined. Empirical and Theoretical Contributions on Embodied Communication across Time and Space*; Bagga-Gupta, S., Hansen, A.L., Feilberg, J., Eds.; Springer: Rotterdam, The Netherlands, 2016; Chapter 1, in press.
37. Participation for All? School and Post-School Pathways of Young People with Functional Disabilities. Available online: www.ju.se/ccd/pal (accessed on 27 October 2016).
38. Haualand, H. Interpreting Ideals and Relaying Rights. A Comparative Study of Video Interpreting Services in Norway, Sweden and the United States. Ph.D. Thesis, Oslo University, Oslo, Norway, 2014.
39. Warnicke, C.; Plejert, C. Turn-organisation in mediated phone interaction using Video Relay Service (VRS). *J. Pragmat.* **2012**, *44*, 1313–1334. [CrossRef]
40. Holmström, I.; Bagga-Gupta, S. Technologies at work: A sociohistorical analysis of human identities and communication. *Deaf. Educ. Int.* **2013**, *15*, 2–28. [CrossRef]
41. Phillips, A.; Terras, K.; Swinney, L. Online Disability Accomodations: Faculty Experiences at one Public University. *J. Postsecond. Educ. Disabil.* **2012**, *25*, 331–344.
42. Trammell, J. Red-Shirting College Students with Disabilities. *Learn. Assist. Rev.* **2009**, *14*, 21–31.
43. Martin, J.M. Stigma and student mental health in higher education. *High. Educ. Res. Dev.* **2009**, *29*, 259–274. [CrossRef]
44. Horst, H.; Miller, D. *Digital Anthropology*; Bloomsbury: London, UK, 2012.
45. Bagga-Gupta, S. *Att Förstå Delaktighet utifrån Forskning som Fokuserar Deltagande och Interaktion/Understanding Involvement and Participation through Research that has Focused Participation Processes and Interaction*; Specialpedagogiska Institutet/The Swedish Institute for Special Needs Education: Härnosand, Sweden, 2006.
46. Bagga-Gupta, S. *Literacies and Deaf Education: A Theoretical Analysis of the International and Swedish Literature*; Forskning i Fokus/Research in Focus nr 23; The Swedish National Agency for School: Stockholm, Sweden, 2004; Available online: https://www.academia.edu/953922/Literacies_and_Deaf_Education_A_theoretical_analysis_of_the_international_and_Swedish_literature (accessed on 27 October 2016).
47. Bagga-Gupta, S. *Project Application to the Swedish Research Council: Participation for All?* The Swedish Research Council: Stockholm, Sweden, 2015.
48. Messina Dahlberg, G.; Bagga-Gupta, S. Enquiring into the research on functionality in Higher Education. Some outcomes from a pilot meta-study. In Paper to be presented at the European Association of Research on Learning and Instruction (EARLI 2017), Tampere, Finland, 29 August–2 September 2017.