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Disability, technology, and Michel Foucault
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Discapacidad, tecnología y Michel Foucault

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Abstract

This article hopes to produce insights via a close and deep examination of disability and technology. Through this analysis integrated with both Foucault's theories and empirical studies, the author wishes to expound whether epistemology injustice is manifested in discourses of disability and technology, whether governance of disability is realized through technological plannings and normalization programmings, and whether technologies enact biopower over disabled individuals by identifying their disadvantages, sorting them based on biological, psychological, and behaviour features.

Keywords: Disability and Technology. Foucault's Theories. Epistemic Injustice. Biopower. Governance of Disability. Normalization Practices.

Resumen

Este artículo espera generar reflexiones a través de un examen cercano y profundo de la discapacidad y la tecnología. Mediante este análisis, integrado con las teorías de Foucault y estudios empíricos, el autor busca explorar si la injusticia *epistémica se manifiesta en los discursos sobre discapacidad y tecnología, si la gobernanza de la discapacidad se realiza a través de planificaciones tecnológicas y programas de normalización, y si las tecnologías ejercen biopoder sobre las personas con discapacidad al identificar sus desventajas y clasificarlas según características biológicas, psicológicas y conductuales.*

Palabras clave: *Discapacidad y tecnología. Teorías de Foucault. Injusticia epistémica. Biopoder. Gobernanza de la discapacidad. Prácticas de normalización.*

Introduction

Michel Foucault is a prominent figure in post-structuralist tenets, though he would deny it to be categorized within any school of thoughts. His thoughts on knowledge, the healthcare services, normality versus abnormality, and the mental hospital, all have shed luminous lights and insights into the discourses and genealogy of disabilities. Corker and Shakespeare[1] write about Foucault's theories in close association with disability studies:

> "[A] Foucauldian perspective on disability might argue ... that a proliferation of discourses on impairment give rise to the category 'disability'. Though these discourses were originally scientific and medical classificatory devices, they subsequently gained currency in judicial and psychiatric fields of knowledge. 'Disabled people' did not exist before this classification although impairment and impairment-related practices certainly did. Thus Foucault shows us that social identities are effects of the ways in which knowledge is organized, but his work is also significant for its explanation of the links between knowledge and power".[2]

Also, for the concept of identity having been persistently spreading out among disability rights movements and disability studies scholarship, the politics of disability identity is typified as a strongest stance against social exclusion of the disabled people. Scholarship and activism in recent years have witnessed a shift from identity-based politics to the notion of poststructuralist critique of disability exclusion. With introduction of the poststructuralist approach into disability studies, it is necessary and essential to adopt the post-structuralist perspectives for modifying and enhancing the concurrent scholarships in disability studies. Corker and Shakespeare inquire into the epistemological mechanism of post-structuralism, and start out a new challenge against both the medical model and the social model. The medical model of disability portrays disability due to modern healthcare classification, and often perceives disability as a way of lacking and a personal tragedy which are in need of exclusion from the major group of normality. The social model of disability applies a historical materialism and considers disability in

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[1] Corker, Mairian, and Tom Shakespeare. Disability/Postmodernity : Embodying Disability Theory. Continuum eBooks, 2002, 78.

[2] Corker and Shakespeare, Disability/Postmodernity : Embodying Disability Theory., 78.

close connection with social and cultural barriers for the disabled individuals, and understands disability as socially constructed of impairments.

The poststructuralist understanding of disabilities offers a middle ground between medical model and social model: it offers convenience to critique the medical model ascertains the social-cultural elements as barriers leading to exclusion; it exhumes a critical view of the social model that place disabled individuals' personal experiences and narratives in ignorance. Corker and Shakespeare emphasize the importance of post-structuralist theories and methods for disability studies and disability activism, as they insist on the view that post-structuralism offers "a different view of the subject, arguing that subjects are not autonomous creators of themselves or their social worlds. Rather, subjects are embedded in a complex network of social relations".[3]

Technology, in accordance to its ancient Greek origin, is *techne*, which means belonging to the arts, skills, tools, and tactics. And technology is more aligned with know-how and the art of using the tools. This meaning incorporates definitions beyond contemporary comprehension addressing technology as merely gadgets. Foucault's theories of technology contribute to the familiar decorum, that technology is associated with codes and customs of politics, aesthetics, and economics, and technology. All these concepts and entities are more considered as an assemblage of technologies. Basically, Foucault differentiates assemblage of technologies into four kinds. First, technology of production - installment of these tools would trigger fundamental changes in any production course.[4] Second, technology of sign systems betokens semiotic artifacts of technologies - how technologies offer meanings and symbols to a given society.[5] Third, technologies of power refers to a stock of technological assets and pragmatics, and how they sustain regulation and management of a given society.[6] And fourth, technologies of the self signify technological traditions that allow individuals to set up their functions in a social world by applying their bodies and minds to accompany and alleviate their own behaviors. A main distinct character between technologies of power and technologies of the self pertains to the state of a technology if it governs and rules others' bodies and minds through hegemony or if it does not dictate others but render a self-regulation of others.[7] This essay is about a Foucauldian approach to understanding disability and technology. In three groups of discussions including technology's relations with epistemic injustice, governmentality, and biopolitics, this essay hopes to answer the key question: are

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[3] Corker and Shakespeare, *Disability/Postmodernity : Embodying Disability Theory.*, 3.

[4] Rooney, David. "A Contextualising, Socio-technical Definition of Technology: Learning From Ancient Greece and Foucault." *Prometheus* 15, no. 3 (January 1, 1997): 401.

[5] Rooney, "A Contextualising, Socio-Technical Definition of Technology: Learning From Ancient Greece and Foucault.", 401.

[6] Rooney, "A Contextualising, Socio-Technical Definition of Technology: Learning From Ancient Greece and Foucault.", 402.

[7] Rooney, "A Contextualising, Socio-Technical Definition of Technology: Learning From Ancient Greece and Foucault.", 403.

technologies favorable to inclusion and equity for disabled individuals?

1. Epistemic injustice

Epistemic injustice is an emerging concept which saturates three fields of inquiries, epistemology, political theory, and ethics. There are two main types of epistemic injustice. Testimonial injustice refers to the scenario when the testimony is unfairly disregarded given the marginalized individuals' invalid positioning. Hermeneutic injustice points to the case when discourses and vocabularies of a community have been dismissing the marginalized groups. Mechanism of epistemic injustice is unpacked in three steps. First, particular knowers are wronged as their testimonies are stifled and the knowers are experiencing hindrance to perceive their interests to know.[8] [9] Second, there are epistemic malfunctions and inequalities by diverting and distorting understanding for the knowers.[10] Third, the aforementioned two steps are accomplished through the means of epistemic practices and institutions - for example schooling and academic subjects are ascertained and standardized in order to divert, annihilate and even forge certain knowledge traditions.[11] In all, an epistemic injustice does not only denote preventing knowers from knowing for their own interest, but also has the institutions unfold to distort epistemic values and principles of the knowers.

Foucault is viewed as one of the earliest theorists whose social and political thoughts could be connected in harmony with epistemic injustice. By examining his theory of power relations I embark on decoding his theory's connectivity with epistemic injustice. Power to Foucault is not conceived to be a metaphysical entity, but manifests its force relations through its exercise.[12] Power is demonstrated through the forces from the sovereign state, but power is also coming into being through its penetration and perfusion throughout the social body like capillaries in a human body.[13] Also, in contrast with state power that often takes actions from the above, power, per understanding of Foucault, can also be produced from the below in the modes of compelling relations throughout the social body.[14] In this case, power relations are regarded neither as homogeneous forces generated from the state or the sovereign, nor as bipartite coercion positions between "the rulers and the ruled".[15] Moreover, power is without being intentional, for power is not purported to achieve a certain aim or to arrive at a specific end; and power does not concern subjectivity, as power is not guided by specific individuals or certain

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[8] Fricker, Miranda. Epistemic Injustice: Power and the Ethics of Knowing, 2007, 147-175.

[9] Pohlhaus, Gaile. "Varieties of Epistemic Injustice 1." In Routledge eBooks, 13–26, 2017, 13.

[10] Pohlhaus, "Varieties of Epistemic Injustice 1.", 13.

[11] Pohlhaus, "Varieties of Epistemic Injustice 1.", 13.

[12] Foucault, Michel. "Nietzsche, Genealogy, History." In Language, Counter-Memory, Practice: Selected Essays and Interviews. Cornell University Press, 94.

[13] Foucault, Michel. *Madness and Civilization*. Routledge eBooks, 2003, 27.

[14] Allen, Amy. "Power/Knowledge/Resistance." In *The Routledge handbook of epistemic injustice*, (Routledge ebooks, 2017),187-94., 188.

[15] Allen, "Power/Knowledge/Resistance.", 188.

interest groups.[16] Lastly, as there are coercive forces denoted by power relations, the power relations yield resistance.[17]

Power relations render the generation of complex histories and social connectivity, which bear the discourse of truth. Foucault further makes a definition of discourses of truth:

> "Truth isn't outside power or lacking in power . . . Truth is a thing of this world: it is produced only by virtue of multiple forms of constraint. And it induces regular effects of power. Each society has its regime of truth, its 'general politics' of truth – that is, the types of discourse it accepts and makes function as true; the mechanisms and instances that enable one to distinguish true and false statements; the means by which each is sanctioned; the techniques and procedures accorded value in the acquisition of truth; the status of those who are charged with saying what counts as true."[18]

The discourses of truth are functioning and executing in two ways: preeminence of scientific discourses and institutions; and the infrastructures and apparatuses (e.g. hospitals, universities, and the media) that bear the weight of power relations. To expound this power mechanism does not target at liberating discourses of truth from the dominion and complexity of force relations, but to detach the social, political, and cultural hegemony of the truth discourses.[19] For instance, Foucault divests the "homogenization, normalization, classification, and centralization of medical knowledge"[20], and this process is realized through founding and expanding the healthcare organizations and institutions. The healthcare organizations and institutions lead to the creation of selection, normalization, hierarchization, and centralization - a disciplinary order that regulates and surveys the subjects and knowledge.[21]

Foucault offers "insurrection of subjugated knowledge" (or the method of genealogy) as a useful resistance to the disciplinary power of the subjects and knowledge, and there are two meanings of it. First, historical knowledge that represents collectives of the society, but they have been hidden and masked - the scholarly knowledge that have been rendered as substandard and inferior. Second, knowledge that is considered insufficiency of erudition and scientific rigor - naive and disqualified knowledge that is produced in the process of selection, normalization, hierarchization, and centralization. For instance, Foucault proposes knowledge from the nurses, patients and delinquents, for they offer "a kind of local critique" providing "its essential strength".[22] This local critique project is in contrast

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[16] Foucault, *Madness and Civilization*. 2003., 94.

[17] Allen, "Power/Knowledge/Resistance.", 189.

[18] Foucault, Michel. "Death and the Labyrinth." Bloomsbury Publishing - Torrossa, 2000., 131.

[19] Allen, "Power/Knowledge/Resistance.", 190.

[20] Allen, "Power/Knowledge/Resistance.", 191.

[21] Allen, "Power/Knowledge/Resistance.", 191.

[22] Foucault, *Madness and Civilization*. 2003., 8.

a form of scholarly knowledge that is disqualified due to “the hierarchy of erudition and sciences”.[23] This “insurrection of subjugated knowledge” offers a strong resistance to epistemic injustice. According to Jose Medina, genealogy has deemed a critical objective to vibrate and vitalize a plural epistemic in which confrontations and contestation among competing power/knowledge systems always exist and stay alive. The genealogical approach is perceived as constituting two meanings.[24] Medina further proposes that the genealogy methods as a salubrious insurrection of subjugated knowledge, which endow the possibility or even capability for the theorists to place epistemic injustice at the center of contesting.[25]

In recent years, there have been studies devoted to detect and analyze epistemic injustice in the healthcare fields, specially psychiatry, pediatrics, and those regarding the disabled, and these studies all lend credibility to epistemic injustice that wrongs the patients and the disabled in a way that their agency and voices have been stifled and distorted.[26] [27] [28] [29] [30] Disability is taken as an exemplar concept, which signifies social exclusion and epistemic injustice. Conditions of being disabled such as impairments, disorders, malfunctions, lack of capacities, and syndromes denote virtues of epistemic injustice for the disabled individuals. They are disqualified as valid and rigorous informants, and their knowledge, deemed less of erudition and scientific grounding, are often discredited and neglected. Here are some studies. Carel and Kidd apply a philosophical interrogation of epistemic injustice entangled for the ill individuals.[31] They argue that cognitive deficiency and emotional instability decrease their credibility of their testimonies; while the ill persons’ subjection of hermeneutic injustice are mainly to due to over-complicated experiences of suffering from illnesses, and the complexities of experiencing illnesses is also pertained to gaps in collective knowledge and understanding. Dohmen conducts a case analysis of epistemic injustice with regards to mental disabilities, and comes to a conclusion with the

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[23] Foucault, *Madness and Civilization*. 2003., 8.

[24] José Medina, “Toward a Foucaultian Epistemology of Resistance: Counter-Memory, Epistemic Friction, and Guerrilla, Pluralism,” *Foucault Studies*, September 12, 2011, 9–35: 12.

[25] Medina, “Toward a Foucaultian Epistemology of Resistance: Counter-Memory, Epistemic Friction, and Guerrilla,Pluralism.”: 31.

[26] Charlotte Blease, Havi Carel, and Keith Geraghty, “Epistemic Injustice in Healthcare Encounters: Evidence From Chronic Fatigue Syndrome,” *Journal of Medical Ethics* 43, no. 8 (December 5, 2016): 549–57.

[27] Havi Carel and Ian James Kidd, “Epistemic Injustice in Healthcare: A Philosophical Analysis,” *Medicine Health Care and Philosophy* 17, no. 4 (April 17, 2014): 529–40.

[28] Paul Crichton, Havi Carel, and Ian James Kidd, “Epistemic Injustice in Psychiatry,” *BJPsych Bulletin* 41, no. 2 (April 1, 2017): 65–70.

[29] Ian James Kidd and Havi Carel, “Epistemic Injustice and Illness,” *Journal of Applied Philosophy* 34, no. 2 (February 8, 2016): 172–90..

[30] Ian James Kidd and Havi Carel, “Pathocentric epistemic injustice and conceptions of health”, In *Overcoming Epistemic Injustice: Social and Psychological Perspectives*, (London: Rowman & Littlefield International, 2019), 153-168.

[31] Carel and Kidd, “Epistemic Injustice in Healthcare: A Philosophical Analysis.”

following aspects: 1) the mentally ill ones will have their credibility booming when there are application of technologies and personal assistants; 2) epistemic injustices engender upon the scenario when hyperbolic examples of the mental disability are generalized and popularized; and 3) the mentally disabled often experience epistemic injustice when interacting with healthcare professional and services providers.[32] Ashley Taylor tackles the alarming and tricky question - if individuals with profound intellectual disabilities should be included in a common education program? Individuals with severe cognitive disabilities are usually thought of having inadequate reasoning capacity and lack in capabilities of participatory decision-making of the public arena.[33] But Taylor's argument diverts from these opinions that systematic exclusion and alienation from the dominant groups, in terms of medical labelling and not inclusive educational plan, induce lack of recognition and understanding of the individuals with profound intellectual disabilities. Scully analyzes the life features of the disabled as to better understand how their life channels the creation of knowledge, evaluation of knowledge, gauging of knowledge, and dissemination of knowledge.[34] This process of knowledge in a cycle of from creation to dissemination also informs well in what ways epistemic injustice is produced for and experienced by the disabled. This study decouples a series of distinctive features of epistemic injustice embedded within the diagram of disability: 1) diversity in disabilities engender the difficulty of generalizing codes and customs of experiencing among different impaired individuals; 2) dominant groups are possible to change their views, adjust their attitudes, and consequently amend their languages towards the marginalized groups, and this process would eventually downgrade the subjugation of the marginalized by endowing them with epistemic justice; 3) a single impairment is highly likely to overwhelm every possible things around a person and the life he or she should led, in a way that an impairment results in lessening or even wholly cancelling the reliability of an disabled individual; 4) epistemic inequalities often lead to the scenario when knowledge and insights of the disabled are not valid or scientifically sound - bad bodies equal to bad knowledge, and the obscure station of their fruits of knowledge renders a much passive position for the disabled.[35] Mladenov & Dimitrova conduct inquiries into parenting of children with disabilities in postsocialist countries.[36] Their study draws the conclusion that those parents suffer from both testimonial injustices (denial of children's disabilities, exclusion of the child, and not being treated as informants) and hermeneutic injustices

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[32] Josh Dohmen, "A Little of Her Language": Epistemic Injustice and Mental Disability," *Res Philosophica* 93, no. 4(October 2016): 669–91.

[33] Ashley Taylor, "Knowledge Citizens? Intellectual Disability and the Production of Social Meanings Within Educational Research," *Harvard Educational Review* 88, no. 1 (March 1, 2018): 1–25,

[34] Jackie Leach Scully, "Epistemic Exclusion, Injustice, and Disability," in T*he Oxford Handbook of Philosophy and Disability* (Oxford University Press, 2019), 295–309.

[35] Scully, "Epistemic Exclusion, Injustice, and Disability."

[36] Teodor Mladenov and Ina Dimitrova, "Epistemic Injustice as a Bridge Between Medical Sociology and Disability Studies," *Sociology of Health & Illness* 45, no. 6 (May 11, 2022): 1146–63.

(misinformation and dominant power of diagnoses).[37] Chapman and Carel dissect the myths surrounding autism.[38] According to their theoretical investigation, autism is commonly considered as a psychological anomaly, and that autistic individuals are not promising a good and wholesome life deviate from promoting thematic issues such as the idea of neurodiversity, a new understanding of human flourishing, as well as fostering self-awareness for autistic individuals.[39]

Social and political transformations take place and come into terms with individuals with disabilities, and while there is a rapid development of technologies, especially the fast growing fields of biomedicine and data science. Schully signifies the dark side of genomics (an outstanding type of biomedicine technology), through the methods of which the genetic variations associated with impairments can be altered and edited.[40] There is a scarcity of evidence suggesting genomics might be a modern form of eugenics, but it ascertains an generalized view that any anomalies or deficits, which are commonly considered as stresses of the state and the society.[41] Schully further argues that bioengineers who are apt to design technology sets for the disabled individuals for most of the cases do not consult the voices and experiences of the disabled people, while attribute to a large sum of investment into technologies that are not really meeting the needs and benefits of the disabled individuals.[42] For instance, sophisticated assistive technologies targeting at meeting the needs of persons with spinal cord injury often fix on a false presumption - these people dream of being able to walk, whereas the priority needs of ones with spinal cord injury are actually more connected with sensory therapies.[43] Ymous, Spiel, Keyes, Williams, Good, Hornecker, and Bennet argue that engineers designing disability technologies rarely value insights and experiences of disability studies scholars, and they even equate disability studies scholarship as invalid and unpractical knowledge - this contributes to the detrimental ignorance of the disabled individuals and their life experiences, and disability technologies are commonly not addressing and promoting the true needs and benefits of the disabled. [44]

2. Governmentality and inequality

Major means of normality governance are statistical reasoning and comparative categories of people’s characteristics. Normality comes in terms of the forced

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[37] Mladenov and Dimitrova, “Epistemic Injustice as a Bridge Between Medical Sociology and Disability Studies.”

[38] Robert Chapman and Havi Carel, “Neurodiversity, Epistemic Injustice, and the Good Human Life,” *Journal of Social Philosophy* 53, no. 4 (March 1, 2022): 614–31.

[39] Chapman and Carel, “Neurodiversity, Epistemic Injustice, and the Good Human Life.”

[40] Jackie Leach Scully, “Disability and the Challenge of Genomics,” in *Routledge Handbook of Genomics, Health and Society*, 2nd ed. (London: Routledge, 2018), 186–94., 119.

[41] Scully, “Disability and the Challenge of Genomics.”, 119.

[42] Scully, “Disability and the Challenge of Genomics.”, 120.

[43] Scully, “Disability and the Challenge of Genomics.”, 120.

[44] Anon Ymous et al., “I Am Just Terrified of My Future” Epistemic Violence in Disability Related Technology Research (the 2020 CHI Conference on Human Factors in Computing Systems, 2020).

relations of social and legal rules and customs with which people are imposed. Normative norms guide people through rules, customs and codes of conducts that they are obliged to conform to. The machinery of controlling ascertains conformity to the social regulations, whereas delinquency and deviation are often dismissed and punished with penalties and sanctions. With regards to normality's social functioning, creating harmony, social stability, and obedience are the objectives of normality - the purpose of it is to have conformity engendered, have deviance prevented, and have society protected from chaos and instability. Normality in the narrow sense of understanding requires comparisons among individuals in light of specific standards. Normality offers an open arena for individuals to question constantly regarding themselves and their social surroundings - what is the social world I am currently living in? Who am I? What should I do? What do I hope for? And all these enticing questions are accompanied by comparing with other people and social entities. These questions with comparisons give rise to regulation of behaviors. Also, the statistical reasonings and arrangements play a significant part in the process of normality functions. As the disability theorist Waldschmidt points out that normality is paved within a concept of modernity and denotes customs of existing behaviors and features, while statistical reasonings are the basic standards;[45] statistical normality functions as an ordering and rationing rules, an persistent documentations of averages and means;[46] Normality comes from aggregates of means and averages.[47]

The normalistic norm always sheds its strongest influence on people who participate in infusion of normalistic norms. Every person is under regulation and measurement of the normal distribution, and we are assessed and evaluated based on standards such as normal means, standard deviation, confidence intervals and among others. For instance, ones' cognitive capacities are measured by the use of intelligence scales based on a normalized bell curve, and upon given the results of the intelligence scores, people cannot help to calculate and recognize how much their scores stand out, on what level their scores are signified, and simply in general - are they intelligent enough ,or in the other way around, are they lacking in cognitive capacities or not. Since these normative standards are categorized in numbers and scales, the normalistic norms are quite driven by sophisticated data arrangements.

Foucault traces the historical beginning of modern clinics, and he discovers in the old times medical language which are prevailed over by medical gazes of seeing

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[45] Anne Waldschmidt, "Who Is Normal? Who Is Deviant?: 'Normality' and 'Risk' in Genetic Diagnostics and Counseling," in *Foucault and the Government of Disability* (Ann Arbor: University of Michigan Press, 2003), 191–207., 194.

[46] Waldschmidt, "Who Is Normal? Who Is Deviant?: 'Normality' and 'Risk' in Genetic Diagnostics and Counseling.", 194.

[47] Waldschmidt, "Who Is Normal? Who Is Deviant?: 'Normality' and 'Risk' in Genetic Diagnostics and Counseling.", 194.

and colloquial languages of talking, and the significant processes involving the changes of "seeing" and "talking" to rational discourse of medicine.[48] Thus in this moment when clarity and precision are required for describing medicines, and it is this moment when the division of the normal and the pathological start to come into formations. This sharp distinction nurtures the power relations within which different types of disabilities or disabled individuals must embed. Also, this division renders normality stand out as the standardized assets and reasonings for evaluating and assessing in medical practices. This division also offers validity and justification of the normality equating to health and wholesomeness, whereas disabilities and impairments are illnesses and deviations from the normality.[49] Disability becomes a burden on society and the state, and it is much tragic to have disabilities or be afflicted with impairments. Hughes further indicates in modernity, disabled people's lives are demeaned and obfuscated by supervision, pathologization, and normalization by rehabilitative sects.[50] Hughes names the modern history for disabled people as "a chilling nutshell"[51], which symbolically resonates Foucault's recognition of the great confinement.

A series of studies, either theoretical or empirical, have investigated the governmentality of disabilities. Kauppila, Kinnari and Niemi examine the trajectories of the European Union's lifelong learning policies excluding individuals with disabilities.[52] The collected data indicates a huge gap between EU's lifelong learning program and its governance of the disabled, as lifelong learning policies are structured not to embrace those with disabilities - the disabled persons do not meet the threshold of becoming lifelong learners.[53] In all, the lifelong learning policies do not practice disability inclusion, instead they marginalize disabled persons.[54] Waterfield applies a Foucauldian approach to examine over 200 media articles of learning disabilities, and she concludes the study with several insights.[55] First, medical discourses of learning disabilities diffuse throughout media articles, having learning disabilities are recognized as both a social problem and an individual problem. Second, the medical approach to understanding learning disabilities shapes, for the disabled persons, the governance, treatment, and

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[48] Bill Hughes, "What Can Foucault Contribute to the Sociology of Impairment," in *Foucault and the Government of Disability* (Ann Arbor: University of Michigan Press, 2005), 78–92., 82.

[49] Hughes, "What Can Foucault Contribute to the Sociology of Impairment.", 82.

[50] Hughes, "What Can Foucault Contribute to the Sociology of Impairment.", 83.

[51] Hughes, "What Can Foucault Contribute to the Sociology of Impairment.", 83.

[52] Aarno Kauppila, Heikki Kinnari, and Anna-Maija Niemi, "Governmentality of Disability in the Context of Lifelong Learning in European Union Policy," *Critical Studies in Education* 61, no. 5 (October 19, 2018): 529–44.

[53] Kauppila, Kinnari, and Niemi, "Governmentality of Disability in the Context of Lifelong Learning in European Union Policy."

[54] Kauppila, Kinnari, and Niemi, "Governmentality of Disability in the Context of Lifelong Learning in European Union Policy."

[55] Bea Waterfield, "Constructions of Learning Disabilities Within Contemporary Canadian Society: Discourse, Biopower and Governmentality" (PhD dissertation, The University of Western Ontario (Canada), 2019).

management of their impairments. Third, the medical discourses which dominate the realm of learning disabilities are coming to match up with the neoliberal ideologies and the neoliberalism's societal structures, and this match-up shed heavy influences onto the lives of the learning disabled. Lastly, learning disabilities cannot be solely comprehended through the medical discourse, and instead learning disabilities are in need of understanding in a broader context of historical, social and cultural meanings. Trambell conducts an inquiry of the Freshmen Mental Health Project, which is to collect data of how the freshman year USA college students are experiencing stigmatization of mental illnesses.[56] The mental illnesses included here are attention deficit disorders, attention deficit hyperactivity disorder, depression, anxiety, obsessive compulsive disorder, bi-polar disorder and among others. The data suggests an alarming existence of stigma among college students, in spite of the efforts of creating a more inclusive environment by installing accommodations and inclusive designs. Moreover, the process of confidentiality represents a Foucauldian governmentality of the mind: college students with mental illnesses are forced to live a secret life, trying to conceal their conditions of being ill, whereas legal restraints of confidentiality protection adds on the requirements of living a secret life; giving out disability certificate and being registered in the medical services render the creation of bureaucracy path. Thomas interrogates the budget cuts of disability benefits in the UK in the time of post 2008 banking crisis, and his study indicates a severe inequalities in the British society, and this inequalities and social divisions strike the disabled people and mentally ill people most vehemently.[57] That disabled individuals are not entitled to work or they have to work in low-income jobs submits disabled individuals with heavier burdens of living. The author proposes the scholarship in the book of "Psycho Politics", which expounds the path of governing disabled people - the psychological regulations of offering disabled individuals employment opportunities have shifted to not offering employment to the disabled people and to reduce the disability benefits. The author also shows the hindrances and difficulties of having the mentally ill individuals and other disabled groups creating cooperatives to resist the benefits cuts, and the author proposes the necessity of calling for more radical reforms. Burch conducts a critical discourse analysis of the 2014 Special Educational Needs and Disability Code of Practice: 0-25 years (2014 SENCoP) published by the UK government.[58] Applying Foucault's theories of governmentality, the study inquires about the smooth transition to adulthood which is constituted in the policy. The study indicates a neoliberal reasoning that channeling and sculpting the younger generations through economic arrangements of employment,

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[56] Jack Trammell, "The Freshmen Mental Health Project (FMHP) and a Foucauldian Governmentality of the Mind," *Journal of Inclusive Practice in Further and Higher Education*, no. 41 (2010): 25–36.

[57] Philip Thomas, "Psycho Politics, Neoliberal Governmentality and Austerity," *Self & Society* 44, no. 4 (August 8, 2016): 382–93.

[58] Leah Faith Burch, "Governmentality of Adulthood: A Critical Discourse Analysis of the 2014 Special Educational Needs and Disability Code of Practice," *Disability & Society* 33, no. 1 (October 6, 2017): 94–114.

independence, and participation and health, and this is backed up by the education policy. The article shows the essential role of the 2014 SENCop as a governmental tool to regulate and manage special needs of the young children. Morgan in her article reveals that the power relations created by special education shed heavy impacts onto parents' choice - the forces of special education render parents as passive receivers, in some occasions showing some resistance to information when making decisions of choices for their children. The study concludes that resistance from the parents sustains a strong opposition against the disciplinary power.[59] Monclus and Tarrès explore the part of occupational therapy among social worker services. The paper applies anthropological methods to detect the disciplinary power imposed by occupational therapy under a more broader governance.[60] The study draws a conclusion that occupational therapy is structured in a way of governmental regulation and planning of disciplining and subjecting ones' bodies. Occupational therapy exercises its disciplinary forces through "distributing persons in space, regulating their use of time, and perfecting their performance of activities".

Disability is a left-aside topic when it is necessary to initiate and engage in discussion on policy making and pragmatics addressing digital inequalities, although disability is recognized as an element which necessitates and enriches the discussions around digital divisions. I think it is a successful realization of digital inclusion if theories and pragmatics related to digital inclusion have placed the disability inclusion at the center of its structures, and more promisingly to prioritize the disability inclusion. There are many studies including both empirical ones and positioning essays to address the digital division and injustice concerning disabled populations. Here are some of them. Adams and Kreps argue that there exists a complicated network of discourses including policy, legality, and social activism that may possibly enable the inclusion and better accessibility for disabled people to participate in the usage of the internet, as disabled individuals are not included in the agenda setting for the internet design and installment.[61] Furthermore, the author Goggin argues that critical disability theories play the crucial roles in better grasping and digesting of digital divides.[62] Goggin concludes with seven connections between disability studies and digital inequality: First, as disability is social constructed and this social construction is embedded within a historical and cultural system of power relations which categorize, standardize, orient, govern and subjugate the disabled individuals; Second, disability is a complex concept enmeshed with a diversity of associative elements that cause the

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[59] Angela Morgan, "Constructing and Maintaining Disability: Discourses of Power, Conflict and Choice in Special Educational Needs Administration" (2005).

[60] Pamela Gutiérrez Monclus and Joan Pujol Tarrès, "Occupational Therapy: Autonomy, Governmentality and Subjectification," *Revista De Estudios Sociales*, no. 57 (July 1, 2016): 68–77.

[61] Alison Adam and David Kreps, "DISABILITY AND DISCOURSES OF WEB ACCESSIBILITY," *Information Communication & Society* 12, no. 7 (October 1, 2009): 1041–58.

[62] Gerard Goggin, "Disability and Haptic Mobile Media," New Media & Society 19, no. 10 (July 10, 2017): 1563–80.

disabled bodies and mind conditions.[63] These causes could be war, ageing, poverty, violence, accidents, and among others; Third, concurrent technological structures are full of hindrance, obstacles, and barriers that practice exclusion for the disabled people; Fourth, disability studies render disability a rather essential idea for enabling and realizing the possibility of inclusion design and universal technologies; Fifth, new perspectives regarding how to rethink and redefine literacy, pedagogues and supportive services are often triggered and guided by more progressive scholarship and activism relevant to disability inclusion (for example, incorporation of tactile language adaptation for visually impaired populations); Sixth, for low-income nations and regions where there are many disabled people having little or no access to disability inclusion infrastructures and awareness, many concurrent information technologies aiming at building global connections are actually quite laggard in the virtue of achieving disability inclusion; Seventh, for countries where disability is closely affiliated with social division and stratification, the state policies making and implementation related to information technologies, often neglect neglects the interests of the disabled people and creates great issues of digital divisions. There is empirical evidence to support the digital divisions for disabled populations. Chadwick, Wesson and Fullwood inquire into the problem of internet accessibility for the people with intellectual disabilities, and conduct a summary of barriers for achieving this accessibility: 1)financial difficulties often render individuals with cognitive disabilities with hindrance to have feasible means to use the internet; 2) people's intellectual disabilities are often marginalized and pathologized as lacking in sufficient capacities and rationality to use the internet; 3) policy makings are falling quite short of addressing the needs of internet usage of people with intellectual disabilities; 4) there are an alarming scarcity of relevant educational and training programs to support and educate the individuals with cognitive disabilities to use the internet; and 5) people with disabilities may have particular impairments that place obstacles for their use of the internet.[64] One more example is about mental health association with digital division. Holstein, Wiesel, Bigby, and Gleeson investigate the digital services of intellectually disabled individuals in Australia, and expounds a similar views as those from Chadwick, Wesson and Fullwood[65]: while emerging digital services narrow the gaps in terms of providing assistive services and welfare sets for the individuals with intellectual disabilities, smooth transition to the smarter technologies is heavily relying on various constituents including the person's basic skills and economic status, and the access to technology and disability assistance.[66] In the meantime, many disabled individuals are highly likely to be

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[63] Goggin, "Disability and Haptic Mobile Media."

[64] Darren Chadwick, Caroline Wesson, and Chris Fullwood, "Internet Access by People With Intellectual Disabilities: Inequalities and Opportunities," *Future Internet* 5, no. 3 (July 17, 2013): 376–97.

[65] Chadwick, Wesson, and Fullwood, "Internet Access by People With Intellectual Disabilities: Inequalities and Opportunities."

[66] Ellen Van Holstein et al., "People With Intellectual Disability and the Digitization of Services," *Geoforum* 119 (February 1, 2021): 133–42.

excluded from these services for lack of training and supportive services to teach and guide them to make use of the new digital services. The doctoral thesis project of Sarah Glencross also conducts an extensive inquiry of how intellectually disabled individuals are experiencing unfairness and inequalities in terms of digital technology application.[67] The author finds out that digital division could not be alleviated provided the scenario that a person with intellectual disabilities who is ageing and does not commute among different regions of living, for an old age and isolation in a single location suggest a strong possibility of lacking in capabilities of learning and mastering a digital technology.[68] This study also lends evidence that family caregivers, social workers, and IT service providers could construct a supportive network to better assist aged people with intellectual disabilities and eventually narrow down the gaps of digital inequality and injustice.[69] Seifert, Reinwand and Schlomann study the digital inequality concerning people with mental health problems, and here are some insights put forward in this study. First, there are 322 million people with mental illnesses who are affected by this digital inequality.[70] Second, digital gadgets such as smartphones and tablets are reported by medical and psychological studies to be feasible and quite efficient to help people in the process of monitoring and managing the treatments and therapeutic practices for their mental health problems. This is especially true for older adults, but these technologies have not been designed with a deep understanding of disability inclusion, and these services provided by these gadgets are not fully accessible to the older generations.[71] Third, intervention can be applied to help patients to better assess and regulate their health conditions and well-being. Fourth, digital equality will facilitate the mental patients to engage in better treatments and recovery plans such as shortening the waiting time for booking medical appointments. However, there is evidence that older patients, especially those living in rural regions are struggling with stigmas and are unwilling to engage in treatments.[72] Apler does an empirical investigation of how children with disabilities and their families engage in using smart technologies, and the author illustrates a significant finding.[73] That children with disabilities have a quite diverse

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[67] Sarah Glencross, “Motivational, Demographic and Contextual Factors Associated With Digital Inequality Experienced by People With Intellectual Disability” (PhD dissertation, University of the Sunshine Coast, Queensland, 2021).

[68] Glencross, “Motivational, Demographic and Contextual Factors Associated With Digital Inequality Experienced by People With Intellectual Disability.”

[69] Glencross, “Motivational, Demographic and Contextual Factors Associated With Digital Inequality Experienced by People With Intellectual Disability.”

[70] Alexander Seifert, Dominique Alexandra Reinwand, and Anna Schlomann, “Designing and Using Digital Mental Health Interventions for Older Adults: Being Aware of Digital Inequality,” *Frontiers in Psychiatry* 10 (August 9, 2019).

[71] Seifert, Reinwand, and Schlomann, “Designing and Using Digital Mental Health Interventions for Older Adults: Being Aware of Digital Inequality,” August 9, 2019., 2.

[72] Seifert, Reinwand, and Schlomann, “Designing and Using Digital Mental Health Interventions for Older Adults: Being Aware of Digital Inequality,” August 9, 2019., 2-3.

[73] Meryl Alper, *Giving Voice: Mobile Communication, Disability, and Inequality*, 2017, https://direct.mit.edu/books/book/4490/Giving-VoiceMobile-Communication-Disability-and.

and varied experiences of using and understanding smart technologies is firmly linked to Pierre Bourdieu's conceptualization of cultural capital, as families and parents with higher cultural capitals and characterized with more educational experiences and social networks are more likely to help and foster a better application of smart technologies to assist their children's communication and education.[74]

3. Biopolitics

The forms of biopolitics came into shaping the life of human beings in the second half of the eighteenth century. Biopolitics refers to the "strategic movement of relatively recent forms of knowledge/power that work towards increasingly comprehensive management of these concerns in the 'life' of individuals and populations".[75] Foucault points out that tenets of modern political theories preoccupy with the judicial concepts of power as individuals possess power in a mode of essential and inalienable rights. Moreover modern political theories position power translatable via subjugating to the sovereignty in a form of social contract, and this surrendering through contractual agreements obstruct a more sophisticated understanding of "productive capacity and subtle machinations of biopower".[76] Foucault further argues that power is executed and realized through action, but not deemed to be exchanged, offered, or retrieved, as he also revokes the assumption of power being repressive.[77] In fact, power produces; it creates reality and rituals of truth. Biopolitics is a system of productive regulations and coordination of life, including introduction of a set of measurement and assessment such as the birth rate, death ratios, reproduction rate, and the production of fertility. A holistic set of economic and political activities related the management of life, along with life aspects of individuals and population control, have all become the embedded objects that biopolitics is meant to exercise and realize its force relations.[78] At the moment a new kind of medicine or medical practice comes to emerge and flourish, the public healthcare system, with its centralized planning and its ability to standardize and normalize this new type of knowledge, would achieve and sustain its power to manage and coordinate. Also, there are a series of activities and practices for standardizing and normalizing the knowledge and pragmatics of life, and these activities and practices include public health campaigns (to educate and to medicalize the population), healthcare charity programs, insurance, people's individual and collecting savings, and social security.[79] All these target at coping with accidents, incidents of illnesses and other

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[74] Alper, Giving Voice: Mobile Communication, Disability, and Inequality.

[75] Shelly Tremain, "The Biopolitics of Bioethics and Disability," *Journal of Bioethical Inquiry* 5 (2008): 101–6., 101.

[76] Tremain, "The Biopolitics of Bioethics and Disability.", 101-102.

[77] Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège De France, 1978-1979*, ed. Michel Senellart, François Ewald, and Alessandro Fontana, Palgrave Macmillan UK eBooks (Palgrave, 2008), 164.

[78] Tremain, "The Biopolitics of Bioethics and Disability.", 102.

[79] Tremain, "The Biopolitics of Bioethics and Disability.", 102.

anomalies relevant to management of life. Biopolitics becomes a regulatory apparatus dealing with almost every aspect of how to manage life, as the regulatory practices could be statistical estimates, measure and forecasts, social security, medical and social interventions, and among other strategies. In the meantime, this mechanism of biopolitics endorses and stipulate what account for normality, how to sustain as an average, what parameters should be adjusted, and how to make restitution to meet the standards of the population.[80] [81]

Mitchell and Snyder perform an analysis to extrapolate the trajectory of disability exclusion under the umbrella of liberalism with a purpose of formulating the calling for disability inclusion in a neoliberal paradigm. They draw the conclusion from their detailed analysis.[82] First, deinstitutionalization approaches are undermined by governmental budgets cuts for healthcare for disabled people (e.g. in-home personal assistance); Second, homogenizing aesthetics and universal design are panned for that neither encourages true and full inclusion of the disabled persons; third, the international disability inclusion campaigns headed by the American exceptionalism do not facilitate inclusion efforts in developing countries, on the contrary, and they are operated in the way shaming the strategies and planning of disability inclusion in those developing countries. The landmark, of the transition from liberal restraints on disordered and ill bodies to neoliberalism's signification of deficiencies through all bodies, refers to the rationale and pragmatics changes in terms of body management. Liberalism regards disabled bodies as non-productive as the disabled ones are not equipped with full capacities to participate in the labor force, whereas some bodies are recognized as normally functioning and have sufficient capacities. In contrast neoliberalism points to the tendency and rationale that all bodies are with some kinds of deficiency or impairments, while neoliberalism prioritizes competition and high production. Because of the discrepancies between high productivity demands and all bodies with deficits, there arise "exacerbated social anxieties, and excessive exposures to toxic environments in order to exploit new treatment markets".[83] Neoliberal rationales always market for the bodies which are always to some degree malfunctioning and in a way not sufficiently healthy. While autonomy of bodies management is celebrated, a new form of biopolitics comes into a form that takes advantages of pathologies as profit-seeking opportunities - "Incapacitated bodies are now the standard to an increasing degree, and for-profit healthcare corporations recognize them as rich veins of data for ailments largely social in their making but often realized at the level of materiality. Such interventions are delivered through the acquisition of over-the-counter medications and other forms of body-alleviating consumption. This shift to contemporary bodies as incapacitated rather than

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[80] Foucault, *The Birth of Biopolitics: Lectures at the Collège De France, 1978-1979*., 238-263.

[81] Tremain, *Foucault and the Government of Disability*., 4-5.

[82] David T. Mitchell and Sharon L. Snyder, *The Biopolitics of Disability: Neoliberalism, Ablenationalism, and Peripheral Embodiment* (University of Michigan Press, 2015)., 35-36.

[83] Mitchell and Snyder, *The Biopolitics of Disability: Neoliberalism, Ablenationalism, and Peripheral Embodiment*., 40.

'autonomously' independent marks a massive shift in the operation of a normalizing contemporary marketplace".[84]

Rabinow and Rose identifies three features of biopower: 1) biopower is the existence of one or more truth discourses regarding the quintessential characters of human being's life, along with the existence of authorities competent enough to verify the truth; 2) strategies of medical and social intervention for adjusting and modifying the life and health issues; and 3) individuals' subjugation under the authorized medical truth discourse and population control.[85] Goodley applies this series of defined features to examine children with autism and their families: first, autism is defined and categorized as a neurological disorder through the authorities of medical knowledge; second, there are strategies and intervention both socially and medically to modify autistic children's behavior and social patterns; and third, autistic children and their families are under the panoply of medical and social work professionals' certified and authorized knowledge and expertise.[86] Spagnuolo's study intends to dissect the hierarchical understanding of capacity and development impacting migrants with disabilities and non-migrants with intellectual disabilities.[87] The study concludes that excessive measurement and assessment conducted towards migrants are struggling through these experiences and whose narratives regarding these developmental and psychological testing are suppressed though show some types of resistance. For instance, responses to these tests craft the danger of being displaced, forcefully isolated, and even separated from their families. This process enacts a biopolitical power rendering the migrants and those non-migrants with cognitive deficits subjected and dehumanized under the state's population control. Altermark's work on intellectual disabilities as biopolitics, elicits an argument against post-institutionalization in analogy with post-colonialism.[88] People with intellectual disabilities have been constantly suffering from brutes of otherness, and in some regions are still institutionalized; they have no voices about their own lives and are distanced from full participation in the social-political realm. Their segregation from the mainstream society resembles much of post-colonialist thoughts that the society is of urgency to be inclusive to those with intellectual disabilities.[89]

Saltes's article interrogates the concept of disability surveillance - a practice involving supervising and monitoring deviant bodies against normative standards,

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[84] Mitchell and Snyder, *The Biopolitics of Disability: Neoliberalism, Ablenationalism, and Peripheral Embodiment.*, 40.

[85] Paul Rabinow and Nikolas Rose, "Biopower Today," *BioSocieties* 1, no. 2 (June 1, 2006): 195–217.

[86] Dan Goodley, "Understanding Disability: Biopsychology, Biopolitics, and an In-Between-All Politics," *Adapted Physical Activity Quarterly* 35, no. 3 (July 1, 2018): 308–19.

[87] Natalie Rose Spagnuolo, "Disability, Displacement, and the Biopolitics of Belonging" (PhD dissertation, York University (Canada), 2020).

[88] Niklas Altermark, "After Inclusion : Intellectual Disability as Biopolitics" (PhD Dissertation, Lund University (Sweden), 2016).

[89] Altermark, "After Inclusion : Intellectual Disability as Biopolitics.", 243-244.

categorizing them as abnormal and classifying them as being at risk.[90] The study draws a conclusion: disability surveillance, though administered as a biomedical control to exclude the disabled people, can also contribute to disability inclusion if the surveillance is operated with recognition of social construction of disability. The pragmatics of using disability surveillance as a tool for inclusion is described as follows: first, it traces the historical emergence of the normality (how disability surveillance with a purpose of preventing economic disasters exercises biopolitical rationales to eliminate the abnormal;[91] Second, it collects medical and welfare information regarding the individuals who are accordinate to receive benefits from the government.[92]

The gradual emergence of technology development has paved the way for new categories of biopolitical control of populations. For instance, the technology of biometrics is a new means of "verification and authentication", and "achieves its signifying status only by being situated within relations of power and disciplinary techniques predicated on individuating, identifying, classifying and distributing the templates of biometrically enrolled subjects across complex political, social and legal
Networks".[93] Hence, biometrics is a network of biopower. Foucault points out that the contemporary state of criminology measures symbolizes the question of the truth: the old question "what have you done" is substituted with a new one "Who are you?".[94] The author Pugliese concludes that "who are you?" is situated as the core question for biometric technologies that specify a subject's embodiment and one's geopolitical status.[95]

Through detailed examination of Foucault's theories of technology of the self, the author Hernández-Ramírez shows how information and communication technologies have shifted the paradigm of how humans change their bodies, mindsets, and recognition of oneself.[96] The author further illustrates how the idea of self modification has been popularized and revolutionized by information and communication technologies, and Foucault's thought of social-technical understanding paves a good way for reaching such understanding.[97]

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[90] Natasha Saltes, "'Abnormal' Bodies on the Borders of Inclusion: Biopolitics and the Paradox of Disability Surveillance," *Surveillance & Society* 11, no. 1/2 (May 27, 2013): 55–73.

[91] Saltes, "'Abnormal' Bodies on the Borders of Inclusion: Biopolitics and the Paradox of Disability Surveillance.", 70.

[92] Saltes, "'Abnormal' Bodies on the Borders of Inclusion: Biopolitics and the Paradox of Disability Surveillance.", 70.

[93] Joseph Pugliese, *Biometrics: Bodies, Technologies, Biopolitics* (Routledge, 2012)., 1.

[94] Foucault, *The Birth of Biopolitics: Lectures at the Collège De France, 1978-1979*., 34.

[95] Pugliese, Biometrics: Bodies, Technologies, Biopolitics., 1.

[96] Rodrigo Hernández-Ramírez, "Technology and Self-modification: Understanding Technologies of the Self After Foucault," *Journal of Science and Technology of the Arts* 9, no. 3 (December 22, 2017): 45.

[97] Hernández-Ramírez, "Technology and Self-Modification: Understanding Technologies of the Self After Foucault."

Conclusion

In summary, per Foucault's thoughts on disability and technology, disability is a concept sustained within a network of biopower, and while technology in most presented cases plays a cooperative role to regulate, administer, and subjugate the disabled people in accordance to the standardization and administration of normalcy, and moreover in the case of information and communication technologies, technology maintains a rather nuanced part in realizing agency and equality for the disabled people.

However, the pathway of integrating disability and technology does not always look bleak. Apart from this confronting relation between disability and technology, I am wondering what the role disability technology could play in promoting physical visibility, welfare, and rights for disabled individuals. Disability technologies, or more specifically assistive technologies, are often designed and implemented to extend the spaces and enhance opportunities for independent living and work for the parts of disabled individuals. However, the concurrent pragmatics and theories of assistive technology have observed some pitfalls regarding the state that assistive technologies only address the observable needs for the disabled populations, but ignore the complexity of broader and deeper conceptualization of achieving disability inclusion. Frauenberger traces the historic changes of disability and assistive technologies and categorizes three sequential kinds of it.[98] First, biological determinism centers on the recognition of disability as a medicalized and abnormal concept that has been deeply embedding and influencing the views and practices of assistive technologies. [99]In this tenet of disability approach, disability is set as deviant and disordered conditions in comparison with normalized bodies and sensations, and a deviation of bodies and minds is in need of curing, therapy, and more frequently, in need of being offered assistance. This view attributes the disabled bodies and minds to the individuals as their personal calamities and tragedies, and this view is crucial to construct separation and exclusion from the normal dominant groups. Technologies designing concepts derived from this view are more oriented toward pragmatically providing certain sets and measures to meet specific functional needs of the disabled individuals. In turn, technologies designed and installed per the standards of the biological deterministic medical model are highly likely to affect and reinforce the social attitudes towards disability - disabilities are still problematic and dysfunctional to the individuals. Since the 1970s an increasing number of disability activists have been fighting against the medical approach, and the unions and alliances of these series of activism have also signified the restriction and restraints of the disabled groups.[100] These activism movements make an affirmative statement - "Disability is something imposed on

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[98] Christopher Frauenberger, Disability and Technology: A Critical Realist Perspective, ASSETS '15: Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility, 2015.

[99] Frauenberger, Disability and Technology: A Critical Realist Perspective., 89-91.

[100] Frauenberger, Disability and Technology: A Critical Realist Perspective., 89-91.

top of our impairments, by the way we are unnecessarily isolated and excluded from full participation in society. Disabled people are therefore an oppressed group in society".[101] This saying differentiates the physical impairment of the disabled individuals and the materialist environments that hinder and obstruct disabled people's participation into the social and political sphere. This leads to the creation of a social creationist view of disability, which underlines the important functions of removing materialist and physical barriers for the disabled people. These emerging thoughts of disability inclusion have been popularized and eventually turned to reforms of disability technologies - to remove materialist barriers and to increase social and political participation.

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[101] Frauenberger, Disability and Technology: A Critical Realist Perspective., 89.

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