

## RESEARCH

# 'The More I Use the Technology, I Know What I'm Capable of Doing': Access and the Discourse of Capacity

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The concept of *access* has remained an important organizing logic within the education of students with disabilities. In this paper, we use spatial theory to explore the capability of technology to make spaces accessible for Maria, a high school user of assistive technology, who is labeled intellectually disabled. In investigating her technology as a means for greater access, we shift attention from the capability of technological tools to the significance of the discursive context in creating (in)accessible spaces. Using concepts of Firstspace, Secondspace and Thirdspace epistemologies (Soja 1996) we identify how differing conceptions of Maria's capacity as a learner produced varied meanings of disability. Such conceptions precluded Maria's 'access knowledge' (Hamraie 2017) while upholding assumptions of independence that were premised on unmediated bodily capacity. We suggest that accessibility may be understood as a socio-spatial phenomenon; we conclude by providing implications for practitioners when supporting technology use by students labeled intellectually disabled.

**Keywords:** Assistive technology; intellectual disability; disability studies; accessibility; special education

The concept of *access* has remained an important organizing logic within the education of students with disabilities (Kiuppis & Haustätter 2014). Reflecting a gradual shift from access to *opportunity* to access to *outcomes*, students with disabilities are increasingly deemed capable of achieving the same educational standards applicable to their non-disabled peers (Yell 2011). Access, therefore, is not only about placement but also about the nature of instructional practice within that placement that subsumes assumptions and beliefs about ability/disability, pedagogical approaches, curricular and supplemental materials, and community culture. In the final count, it is about identity making (Titchkosky 2011; Author 2012). In this paper, we engage with the concept of access by using spatial theory (Lefebvre 1991; Massey 2005; Soja 1989, 1996) to investigate the attempts of a US public school in supporting a high school student with intellectual disabilities, Maria.<sup>1</sup> Focusing on her experiences as a user of Assistive Technology (henceforth AT), we inquire into the ways in which the promise of technology to deliver access is intertwined with the discourses of (in)capacity that circulate across multiple learning spaces.

## A Spatialized Understanding of AT

Typically, within analyses of disability, spaces are assumed to be fixed—they constitute the presumed inert background against which the historical and social development of the phenomenon is investigated. In recent years, increasing numbers of scholars have problematized such essentialist understanding of space, marking the 'spatial turn' in social science research (Harvey 2013; Lefebvre 1991; Massey 1994, 2005; Soja 1989, 1996). A dynamic rather than a static entity, space is now understood as socially constructed, even as the social is spatially constructed. Soja (1989) argues that all spaces encompass a triad that includes how a space is perceived (First space), how a space is built (Second space) and how a space is lived (Third space). All elements of space are open to the potential for change and movement, i.e., all aspects of space constitute 'an open ongoing production' (Soja 1989: 120). Massey (2005) additionally, argues for a careful consideration of power relations, i.e., who is allowed to imagine spaces, and who is restricted to upholding the social processes that define a space. For instance, to what extent do the people attending and working at a school contribute to the imagining of that space? Typically, the work of 'doing school' is left to the people occupying that space, while the physical built environment may have been designed and built by another group of people at a prior moment. Spaces, then, are more fluid than we understand them to be and always informed by our own socio-political location

<sup>1</sup> Pseudonyms have been used for all participants described in this study.

(Massey 2005). Spaces have the potential to shift and change their meaning through the production of social relations within and outside of such given spaces.

We found a compelling connection between the emphasis on the dynamic nature of space and the tenets of disability studies in education (DSE). Disability studies is an interdisciplinary field of scholarship that inquires into the meanings of disability that emerge in the interaction between individuals and institutions in society (Davis 2013). Scholars within the tradition of DSE extend this lens to schooling communities to disclose and interrogate notions of normalcy and deficit that undergird teaching-learning systems (Gabel 2005). They contrast the deficit-based 'medical model' approach ubiquitous in schooling practices with the 'social model' that emphasizes the role of the physical and social environment in the construction of disability (Oliver 1990; Oliver & Barnes 1998). More recent theorizations have argued for a 'complex embodiment' (Siebers 2008) of disability that encompasses both medical and social constructionist elements (Erevelles 2011; Siebers 2008). In taking up spatial theory alongside DSE, we similarly acknowledge our interest in avoiding binary approaches to disability, attending rather to the complexity of material embodiment across spaces that are always already discursive.

We employ the above theoretical lenses to better understand the use of Assistive Technology (AT) in schools. In the US, AT was explicitly defined in 1988 in the Technology-Related Assistance Act as, 'any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability' (Bouck 2016). This expansive definition encompasses various types of products and mechanical devices with different levels of complexity to support varying kinds of disabilities (Maor, Currie & Drewry 2011). In this paper, we focus particularly on software-based AT that can support activities such as text-to-speech, dictation, and word prediction. US federal guidelines state that AT must always be 'considered' for students with disabilities and should be detailed on students' Individual Education Programs (IEP).<sup>2</sup> However, research shows that AT remains underutilized in school settings (Bouck 2016; King-Sears, Swanson & Mainzer 2011).

The issue of underutilization despite evidence of the positive impact of AT on student learning, especially in math and literacy registers a complex problem (Bouck & Flanagan 2009; Jeffs, Behrmann & Bannan-Ritland 2006; Maor, Currie & Drewry 2011). Teachers, it would seem, remain confused about the fundamental purposes of AT (Bouck 2016; Shepley et al. 2015). They seem to conflate *instructional* technology with *assistive* technology viewing such supports as temporary rather than as necessary for students with disabilities to access curricular content. AT then is assumed to be a 'crutch' (Edyburn 2004), and success for the students is measured by an eventual fading away of the technology. Additionally, both general education and special education teachers do not know how to meaningfully integrate technology into their pedagogical practices (Hollins 2017; Kennedy and Deshler 2010; Maccini, Gagnon & Hughes 2002; McLaren, Bausch & Ault 2007). Technology continues to be used as an add-on to traditional content, rendering it distracting, overwhelming, and ineffectively utilized (Kennedy & Deshler 2010; Mayer 2009). Not surprisingly, there is a discrepancy between school personnel accounts of AT usage in schools, and parent/student descriptions (Bouck 2016). There is also little research that investigates the experiences of student AT users themselves, particularly students with intellectual disabilities (Boot et al. 2017). The inclusion of users in investigating its benefits reflects an orientation that understands technology as always value laden, rather than a neutral construct (Polgar 2010; Sheldon 2004).

In making central the perspectives of a student presumed intellectually disabled, this study not only addresses an important gap in the literature reviewed above, it takes up a critical approach to the significance of technology in schooling. In other words, our exploration of technology does not take as self-evident its material benefits to users. We follow Foley and Ferri (2012), who reject any claims that technology may be neutral; they argue, instead, that it is inseparable from the larger social context such that 'normative assumptions about how bodies are supposed to operate are deeply embedded in all aspects of technology' (p. 2). We see AT, then, as an array of 'socio-technical' (Guillemin 2005) tools that always already arrives with sociocultural attachments that produce particular kinds of embodied experiences for the user. In that regard, even as technology may evoke 'cyborgian' descriptions of AT users (Haraway 2014), we do not presume that such descriptions automatically have liberatory significance (Kafer 2013). Instead, we use the interaction of the user with the built environment as a starting point for understanding the design of spaces (Hamraie 2017). It is not AT itself, therefore, that marks accessibility; rather, meanings of access are constituted in the relations between the AT user and the schooling environment. Our main research questions for this study, therefore, were: What is the pedagogical context of AT use in classrooms? What beliefs and expectations about student learning and literate achievement inform pedagogical practice?

## Method

Qualitative methodologies are particularly suited to understanding process and for disclosing the experiences of marginalized communities (Ferguson & Ferguson 1995; Maxwell 2005). In seeking to understand the role of AT in the empowerment of students with disabilities, we attach particular significance to the narratives of participants as disclosing important phenomena, in this case, within schools (Polkinghorne 1995). The research reported in this paper was conducted during the period of January 2013 to June 2014 in a large urban school district in the northeastern

<sup>2</sup> All students in US public schools who receive special education services receive an Individualized Education Program (IEP) that describes the supports and services that (s)he will receive in school.

corridor of the United States. It was part of a larger study to investigate how AT may be interconnected with the achievement of important educational outcomes for students with disabilities, with a particular emphasis on literacy development. Approval to conduct the study was granted by the Institutional Review Board at the research institution and by the school district. Data was collected across two sites—one elementary and the other secondary. In this paper, we report on the data collected at the secondary site—a self-contained secondary school for students with intellectual and emotional disabilities. The first author collected all the data for the study; the second and third authors participated in the analysis and interpretation of the data.

### **Context**

The school administration invited the first author to conduct the study in this building in the hope of simultaneously receiving some support on AT. The school was one of the many self-contained special schools for students with significant developmental, intellectual, and emotional disabilities that constituted a part of the school district system. Within the school, students were physically separated based on their capability to successfully complete standard/alternate forms of state assessments. Those who could do so, were located in one 'wing' while others, including Maria (the AT user in this study), who were deemed incapable of meeting normative graduation requirements, attended classrooms in a different part of the floor. Reflecting the well-documented over-representation of students of color in special education (Artiles et al. 2010), the population of this school was overwhelmingly African-American or Latino/a. Additionally, publicly available data disclosed that about 90% of the students in the building were eligible for subsidized lunch, a marker of the socioeconomic status of the student population. Maria, a Latina student labeled as intellectually disabled as disclosed by her teacher, had been at this school for about four months by the time the study commenced. She used AT supports including Co-Writer™ and Dragon Dictate™, which had been made available to her since elementary school. Maria's IEP also assigned a full-time paraprofessional to her.<sup>3</sup> Over the course of the study, Maria was supported by two different paraprofessionals, Ms. Rainer and Ms. Williams, who brought completely different orientations to Maria's learning needs.

### **Data collection and analysis**

Data was obtained through semi-structured interviews and participant observation at the school (Bogdan & Biklen 2007). This included two interviews with Maria's teachers, two separate interviews with her occupational and speech therapist, one interview with her paraprofessional, at least two interviews with her mother, Isabella, and both formal and informal interviews/conversations with Maria. The purpose of the study was explained during an initial meeting with educators at the school (with Maria present) prior to the start of data collection. We held an open discussion of how the role of the first author could benefit the school as well as possible ways it might interfere with everyday routines. No significant challenges were raised. Subsequently, during individual meetings, all participants had further opportunity to ask questions about the study. Procedures for maintaining confidentiality were explained to each before signed consent was obtained. Two of the educators, Mr. Odell and the occupational therapist, expressed some anxiety about being recorded. Detailed notes were taken during those interviews instead. Isabella and the school agreed that, during meetings with Maria, the first author would provide direct support to her on strengthening her knowledge of her AT supports. Besides the pre-arranged interview sessions, the first author visited the school 18 times, usually for a period of 90 minutes; during those days, observations were conducted in the classes attended by Maria. This spanned her sessions with her therapists, as well as her lessons with Ms. DeForge, her English Language Arts teacher and Mr. Odell, who served as not only her math and social studies teacher, but also her homeroom teacher. While we hold as central Maria's perspective as user, we deemed that interviews with her mother and teachers were necessary to understand the ways in which the environment contributed to the development of her experiences. Disability studies scholars have reported on the significant gaps between schools' and families' conceptions of disability, and we wanted to understand how this played out in Maria's experience (Bjarnason 2009). All recorded interviews/conversations were transcribed verbatim and extensive field notes were maintained, generating about 475 pages of data. Additional data included writings/poems by Maria completed with her AT supports.

Data analysis was inductive and iterative (Bogdan and Biklen 2007). In the first cycle of coding, field notes and transcripts of each individual interview and/or conversation, as well as recorded sessions with Maria, was coded using descriptive in vivo coding of data chunks (Miles, Huberman & Saldana 2013). We wanted to remain immersed in the stories shared by participants without becoming too embroiled in the 'snipping' of those stories for the purposes of data reduction (Green 2015). We followed the distinction made by Polkinhorne (1995) between the *analysis of narratives* and *narrative analysis* to emphasize the former. This means that we identified broad categories, attended to their relationships with each other, and disclosed commonalities across multiple sources of data to produce general knowledge from a particular collection of stories (Kim 2015). Our decision to focus particularly on the stories of Maria (and her mother) was deliberate; we hoped it would disclose elements obscured within mainstream discourses on technology use. Transcripts and notes were analyzed by at least two evaluators at this juncture and discrepancies addressed and

<sup>3</sup> Paraprofessional educators in US public schools provide support in the classroom, typically assisting students with documented disabilities under the guidance of certified teachers.

resolved. During the next phase of analysis, we looked for connections across emergent themes to identify the school's curricular narratives of Maria and her peers, Isabella's narratives of Maria and the school, and finally Maria's narratives of herself and of the school. As we examined the themes emerging from these narratives, we were able to disclose the linkages more clearly between space and the discourse of capacity.

### **'Feeling the Burn' versus 'On-board' Commitment: The Clash of Firstspace and Secondspace Epistemologies**

At the heart of struggle for Maria's learning lay the discrepancy between the perspectives of educators and Maria/Isabella on the status of technology in school-based environments. For the educators within this building, technology served largely as a means to satisfy externally driven mandates of accountability. It was not uncommon to observe teachers working on one of two or three large Apple™ computers at the back of each classroom. Ms. DeForge, the Language Arts teacher, for instance, used a web-based program with her students to generate scores that were then made directly available to her and to her superiors to make academic programming decisions. Students might be given access to computers as reinforcement for other work performed in the classroom. There were few, if any, lessons that were observed in which these computers played an integral role in the instruction of content (each of these classrooms had anywhere from 6–10 students at any given time). This meant that instructional work in these classrooms relied to a significant extent on traditional formats that included teacher-centered approaches to whole-group presentations and discussion, and limited modes of learning and expression. No instances of multimodal learning where students might utilize technology to create multi-media products were observed during the period of the study.

The frame of instructional planning brought by these educators in the school space clearly did not include technology as integral to pedagogical practice. Ms. DeForge openly confessed her inadequacy in this area despite her efforts to 'play' with the Apple™ computer in her classroom. She maintained a stance of some suspicion towards computer-related activity of her students, convinced that 'they're checking their emails if you're not paying attention.' In conceptualizing the design of this environment, she may be understood as deploying *Firstspace* epistemologies 'that become fixated on the material form of things in space' (Soja 1996: 76).<sup>4</sup> The utility of technology was narrowly conceived, determined by objectively measurable results such as student scores.

For Mr. Odell, Maria's social studies and math teacher, the utility of technology could not obscure the fact that it left students reliant on an artifact that might fail at any time. This aligned with his suspicion of 'short-cuts' that might negatively impact students' long-term educational outcomes. For instance, when he proposed more quizzes to help students remember their multiplication tables, he informed his class that he 'wanted [them] to feel the burn and the suffering' (April 19 field notes). It was not surprising that he recommended that Maria should use her technology 50% of the time, while relying on her own handwriting the other 50%. Mr. Odell's ambivalent relations with technology may be understood as partly appropriating cultural discourses privileging independence as a desired life goal that has been critiqued in disability studies scholarship (Davis 2013). The widespread nature of such ableist discourses (Edyburn 2004) means that even though the literature overwhelmingly documents the benefits of AT for students, it is crucial to facilitate teachers' understanding of such benefits. The significance of a thoughtful preparation of teachers to use such technology-based supports has not yet been realized (Author et al. 2014).

Consistent with that position, these educators seemed to understand the use of technology in school as a 'crutch' (Edyburn 2004) that could be misused by the user and/or promote an inaccurate measurement of the student's 'real' capability. Indeed, the label that seemed to stick to Maria during her first year in the building was 'lazy'—Maria's reluctance to write by hand and her desire to rely on her technology instead was received by her teachers as an expression of her willful disengagement. Collectively, the naïve use of technology for learning, the low expectations of student performance, and the promotion of independence as a shared value, lead educators to discount the capability of technology to enable Maria's functioning. The only educator who brought a different stance was her current paraprofessional, Ms. Williams, who took a deep interest in learning about Maria's technology-based writing supports.

Against the generalized suspicion of Maria's intentions and seeming disregard of the significance of technology for Maria's learning, Isabella insisted that school professionals demonstrate that they were 'on board' with her daughter's technology-based needs. Rooted in her experiences as a single mother living in a largely working-class community, her stance towards the situation more closely resembled a *Secondspace* epistemology, which may be 'entirely ideational, made up of projections into the empirical world from conceived or imagined geographies' (Soja 1996: 79); it indexed an imagined space of greater learning for Maria. Such a school space, however, required the commitment of educators to the significance of technology for Maria's learning. Isabella's struggle in this school to elevate the importance of technology discloses space as a material-discursive entity that acts differentially upon the individuals who populate it. Spatial theorists have argued that for too long, space has remained simply a container rather than an active agent in the constitution of experience (Massey 2005; Soja 1996). In Isabella's 'real and imagined' understandings of accessibility within this school space (Soja 1996), we recognize the workings of material and affective dimensions: Isabella's sheer

<sup>4</sup> According to Soja (1996), each term in the trialectics of spatiality may be contained within the other, but they can also be studied in 'splendidly specialized isolation' (p. 74). This paper takes up the latter approach to account for the ways participants took up AT within this space. As 'modes of accumulating spatial knowledge' (p. 74) each produces particular orientations and stances, in this case, to Maria and AT.



frustration in encountering reports of a perpetually broken scanner that could aid Maria's participation; the school's tacit skepticism of Maria's pain from spasms in her hand; Maria's status as the only wheelchair user in the building and its impact on her teachers' sense of capability; and the repeated embodied expressions of indifference Maria bore from school personnel towards her technology.

These struggles of Maria and Isabella within this school space coalesced with the historical categorization of intellectual disability in the school district that required her to be educated within this special school at this time—a space that itself bore sedimented histories of low expectations, eugenical thinking, and positivist methodologies (Gallagher et al. 2006). When Isabella entreated the educators to recognize that since they 'don't know how she [Maria] feels, or what she can handle' they should err on the side of assigning her [Maria] the competence to make the appropriate decision, she [Isabella] was implicitly referencing the necessity for engaging those histories in crafting more inclusive place identities (Massey 2005). Simultaneously emergent were the different interpretations of 'normal' that have been recorded between families and school professionals (Lalvani, 2015).

### **'I Improved, I Improved! I Am Happy I Improved!' A Brief Note on Maria's Response to AT During the Study**

At the time the study was initiated, Maria was already proficient in the basic affordances of AT (via the SOLO™ package) that had been made available to her since the time she had been in elementary school, as reported by Isabella. During the study, the first author primarily focused on the metacognitive elements in her selection and use of AT resources to enable her to maximize her learning performance. For instance, we drew explicit attention to specific cognitive tasks supported by the use of Dragon Dictate™ or Co-Writer™ and eventually Kidspiration™, that could then support the process of composition from prewriting or draft writing to a finished, edited version. Simultaneously, she 'played around' with the freely available web technologies that were introduced to her, which included Google Chrome™ and the extensions for increasing accessibility available through this engine. The cumulative effect was that Maria came to refine her understanding of the suitability of these supports. She realized for instance that Dragon Dictate™ was unhelpful in the noisy environment of the classroom. She recognized the improvement in her performance when her sentences were longer and more complex because of AT support. Her affirmation that AT had 'changed the way I think about school' echoes the academic and social-emotional benefits that AT student users and their families have described (Harper et al. 2017).

### **The Emergence of (In)capacity across Space-time(s)**

In this section, we investigate the circulation of discourses of (in)capacity in the school alongside the quest for accessibility. We argue that such discourses constrained Maria's use of AT in this setting. Notions of (in)capacity surfaced particularly within the different ways participants conceived of disability, their recognition (or the lack of thereof) of the perspective of the AT user, and their differing orientations to technology as a likely tool for independence. Additionally, as we attended closely to Maria's own expressions, we recognized the liberatory significance of *Thirdspace* (Soja 1996). This epistemological location encompasses the other two, while also remaining distinct from them. It constitutes 'lived space as a strategic location from which to encompass, understand, and potentially transform all spaces simultaneously' (p. 68). In imbricating the duality of First- and Secondspace, Thirdspace necessarily captures the contradictions and struggles to become the 'spaces of resistance to the dominant order arising precisely from their subordinate, peripheral or marginalized positioning' (p. 68).

### **Meanings of disability across multiple spaces**

Maria and her mother seemed to uphold fluid meanings of disability, while educators remained for the large part grounded in a fixed, deficit-based model. We begin with Maria's own understanding of herself as a disabled person that defied easy categorization into one model or the other. She noted: 'I wouldn't say that I'm a woman with special needs. I like to think of myself as doing different things a different way.' Maria authored a poem using AT entitled 'My Disability' in which she wrote: 'I am a person with a disability but I don't take it as a disability; I take it as a challenge. Every day I learn new ways to use it in life.' Later in the poem she detailed the ways in which her hand spasms and muscle cramps dictated the level of support she might need:

There are some days my body hurts because I just finished working on exercising on the parts of my body that needs to be used in life. Or that just means that my body needs to stop; that's when I ask someone to help me.

Maria embraces the fluidity inherent in her experience of disability and the shifting nature of support and independence. Support needs might change day to day, minute to minute. Disability labels such as cerebral palsy, therefore, were something she avoided using until there was a level of intimacy with a person—'until I know you better.' Taking the perspective of a non-disabled person who might 'have no idea what [cerebral palsy] is,' Maria's move is counter-hegemonic—it preempts others who are likely to misconstrue her own capacity; but she does so to retain connectedness with her social partners, rather than reject them on imagined ableist grounds. In doing thus, she eschews the divisiveness of binary thinking and upholds the 'radical openness' of *Thirdspace* envisioned by spatial

theorists (Harvey 2013; Soja 1996). She acknowledges the *multiplicity* that inevitably characterizes her subjective relations—she is not only a student in the school, but a friend and casual acquaintance in other spaces including various online collaborative spaces in which she participated to develop her literary capacities. Such multiplicity demanded a lived response that rejected essentialism and instead, captured a *mestiza* consciousness that continually straddled boundaries such as ability/disability; dependence/independence; normal/special, etc. (Anzaldúa 1987; Soja 1996).

Not unlike families of students with disabilities across varied cultural contexts (Kozleski et al. 2008), Isabella resisted the expectation to submit to professional judgments about her daughter's capability. For her, Maria's capability may have been irreversibly compromised by her disability ('that's all part of the CP; that's never gonna change'); however, she implicitly acknowledged the transformative potentiality of spaces in which Maria was required to perform as a learner. The intertwining of technology with bodily capacity could produce new understandings of disability and by extension, new space-times. It allowed her to envision a future for Maria when she might have 'a chance of actually fitting into the job world.' Isabella's emphasis on the potentiality of this space draws on *Secondspace* epistemologies wherein her *figured* understandings of Maria-in-the-world locates her within a cultural context where able-bodied norms predominate, but where technology might afford her the tools to agentively engage with them (Holland et al. 1998; Soja 1996).

Isabella's approach contrasted sharply with educators' *Firstspace* perceptions of technology as a neutral ahistorical tool bearing little connection to the school space, which was, in turn, perceived as fixed and unalterable. Educators were more likely to describe their students, including Maria, in terms of inadequate capacity. The label of 'mental retardation/intellectual disability' used to classify the students in this building, seemed to serve as the reference point for educators' understanding of Maria, who had also been assigned that label. For example, Ms. DeForge in describing her students' capabilities, noted: 'There's a lot going on but they can't put it in words; so, they just draw. *She* [Maria] can decode; but she can't read fluently. And that's most of my kids.' In this setting, Maria's construction as a learner was already framed by the teachers' understanding of her peers as lacking the intellectual capacity for grade-appropriate curriculum. Believing instead that students with this label would benefit more if they were taught 'real-life stuff,' Ms. DeForge, clearly drawing on a 'fixed-ability' mindset (Hart et al. 2004) seemed to foreclose technology as a means to disclose greater learning capacity.

Inasmuch as the label of 'intellectual disability' or 'mental retardation' constrained educators' conceptions of Maria's capability, Maria's own presentation of herself also appeared to produce some confusion. As the speech therapist, Ms. Vincent, remarked, 'I feel like most people treat her as if she has no disabilities because she doesn't seem like she really does, when you talk to her.' Curiously, this observation did not appear to trigger a suspicion of the disability category assigned to her and/or the need to reconsider Maria's capacity suggesting instead that the 'real' intellectual disability remained obscured (Kliwer, Biklen & Peterson 2015). The fact that she could interact easily with adults and peers alike, just made her seem 'more higher functioning' (Ms. Vincent) within the schooling space/environment. It seemed that despite evidence of her sophisticated way of interacting with her environment (mediated partly by her use of AT), the pre-existing discourse of intellectual inferiority attached to people with intellectual disabilities circulating within this school space already marked her as a particular type of student.

### ***Maria's 'access-knowledge': Choosing to be 'on the margins'***

Isabella's stories about Maria's schooling over the years were punctuated with the role of many paraprofessionals, ranging from supportive to indifferent. The paraprofessional preceding Ms. Williams for instance (Ms. Rainer) had been observed to persist in descriptions of Maria as 'lazy' and had little or no interest in either her technology or in her perspective as an AT user. Not coincidentally, that was a year marked by Maria's frequent absences from school and unpleasant interactions between the school and Isabella regarding lack of supports for Maria's use of technology. Maria was described by her teachers as 'overly sensitive' and at one point broke down in tears during an IEP meeting when staff described her academic challenges. Maria's experience of the school space changed with the arrival of Ms. Williams, who working alongside Maria to learn and support her use of the technology, noted that they operated as 'a good team.' It was not a coincidence that at the end of that year, Maria seemed to emerge as a confident learner, described by Ms. Williams as 'on point,' 'well-prepared' and 'way ahead of the game.'

Maria's AT-enabled lived experiences pushed back against *Firstspace* expectations of her learning within this schooling space—it afforded her the potential to engage with, and transform, material-discursive spaces not designed with her learning profile in mind. Chronicling the histories of practice that preceded Universal Design, Hamraie (2017) notes that the epistemological claims of disability activists were rooted in the 'politics of knowing-making' (113)—how they could obtain and engage with technologies, for what purpose, when and with what adjustments. Such experiential knowledge of access forged in the interaction with socio-spatial conditions offers new ways of understanding spaces. However, Maria's 'access-knowledge' (Hamraie 2017) was rarely recognized within the school.

One exception was Ms. Williams, the paraprofessional on whom Maria was dependent for everyday support, and who remained inseparably linked to the affordances of the technology to transform the schooling space for Maria. Ms. Williams' decision to place the onus on Maria to assess her needs stemmed from her conviction that 'ultimately, she will

be the best expert on the technology.' Maria, too, identified herself as the primary knower for determining the utility of technology at any moment. Recognizing that when confronted with a task, she 'can't figure it out in like two seconds; I'm not that kind of person' she preferred to take her time, a condition available to her at home rather than at school. Such flexibility of time allowed her to use her technology at home in ways obscured at school, such as in her regular participation in an online community of writers. Repositioning Maria as an expert, then, altered the capacity of a space to produce desired learning outcomes. This conviction of the transformability of space undergirded her desperate plea to her teachers: 'basically, trust me!'

Drawing on the writings of hooks, Soja (1996) notes that the political project that delivers the liberatory potential of *Thirdspace* is 'to occupy the (real and imagined) spaces on the margins, to reclaim these lived spaces as locations of radical openness and possibility, and to make within them the sites where one's radical subjectivity can be activated and practiced in conjunction with the radical subjectivities of others' (p. 99). Maria's commentary about her experiences at a conference for youth users of assistive technology illustrates this significance of a *Thirdspace* epistemology. As she heard the experiences of other school-aged AT users with increasing recognition, she declared to herself: 'OK, this is my genre. This is what I am going through.... This is what I need in the future when I'm wanting to write stories and stuff like that.' Maria was registering awareness of the larger sociopolitical context of her own technologically mediated writing and its impact on her as a AT user both now and in the future. Her relationship to her technology was not only strengthened in the discovery of its relevance in the lives of other youth with disabilities, it affirmed her status as a knowledgeable user whose experience had epistemic significance. When she returned from the conference and stated with both confidence and frustration that her teachers not only did not understand, 'they just don't get the whole concept of it,' she was locating herself within a particular knowledge community, i.e., AT users, whose collective experience had itself been forged within a range of inaccessible spaces. For Maria, such collective 'access knowledge' was borne out of 'everyday practices of remaking' that were 'infused with a disability politics of independence *from* expert medical knowledge and interdependence *between* disabled students' (Hamraie 2017: 114, emphasis in original).

### **The goal of independence**

Independence remained a persistent theme that emerged across interviews with Maria, her educators, and Isabella. For Maria herself, independence brought with it the opportunity for access. Speaking of her motorized wheelchair, she noted: 'I'm more independent than I was last year; so. I feel more comfortable.' When asked to describe herself, she made reference to 'Push Girls,' a reality TV show that follows the lives of four women who are wheelchair users. Maria appeared to see elements of herself in this group that comprised actresses, an athlete, a dancer, and advocate. When Maria described these women, she was quick to link them with access. 'So, it's basically girls in wheelchairs who know how to get around with their car and stuff like that.' As her confidence grew with using her electric wheelchair, so too did her sense of self and her sense of purpose. Notions of independence are heavily tied to experiencing such purposefulness and to being of service to others (Lukin 2013). She described her satisfaction in 'moving around' in her motorized wheelchair, 'bringing the attendance to the office, [or] with typing work for the teachers' and 'answering [the] phone at home.' Maria's sense of her own capacity expanded with the increased independence and mobility afforded by the wheelchair permitting her to build a skill-set that allowed her to imagine her adult future. 'So, I guess the more I do things, the more I see: "Oh, I can do this. So, I'll be capable for this job."'

Both Maria and Isabelle understood technology as *integrated* with her claims for capability. Straddling *Second-* and *Thirdspace* epistemologies, their embodied experiences enabled their recognition of technology as a transformative opportunity for developing greater independence; their visions exceeded the immediate benefits of the tool. On the other hand, the school staff seemed to view technology use as *extraneous*, even a hindrance, to developing her capacity for independence in the school space. For example, when Maria's para, Ms. Williams, explained the difference between Maria and her former students who were 'a little more independent than she is,' she noted: 'I'm always trying to push her toward independence—if I feel she can copy what's on the board, then I will allow her to copy it from the board. Just so she still gets to use her hands.' For Ms. Williams, who, after all, took up the implicit expectations placed on her by the school, her given role was to 'push' Maria towards independence. The goal of such independence was premised on unmediated bodily capacity to accomplish 'normal' goals (for instance, writing whenever possible). In other words, from the perspective of the school, if she could only write more with her hand she'd be more independent!

Users of technology understand that the potentiality of such tools is never fixed. Indeed, Guillemin (2005) describes the 'critical compromise' that users of technology must make as they negotiate multiple sociocultural space-times. As Maria's description of her own disability as fluid and shifting suggests, her experiences of such 'critical compromise' might have suggested other norms of practice in school that did not rely on binary understandings of dependence/independence. Bringing an 'objective' *Firstspace* stance, the school, however, imposed an understanding of independence on Maria that discounted her embodied experience within multiple learning spaces.

### **Discussion and Implications**

The circulation of discourses of (in)capacity in this setting must simultaneously be considered alongside the raced and classed locations of the student population that inhabited this school space and its impact on school practices. For

example, the defunct status of the scanner in the building which could have benefited many students, certainly could be attributed to a genuine lack of resources rather than indifference of the school. Yet, given the well-documented unequal nature of school outcomes produced in part by differential social positions of families (Ong-Dean 2009) it does raise the question of whether such continued defunct status might have occurred at a building within a different neighborhood that was marked by other racial and socio-economic characteristics. Environments are experienced differentially by the people who inhabit them and therefore, the values that inform them need to be made explicit (Hamraie 2013).

The clash of epistemologies in this school space was evoked through the particular values that informed educators' conceptualization of the futures of the students within this building, i.e., low expectations, disability as individual deficit, and the primacy of able-bodied/able-minded norms. This meant that Maria's computer technology was already compromised as a tool for accessibility. Educators' prescriptions for Maria to use her technology 50% of the time and her own handwriting for the other 50% were premised on notions of physical environments as existing prior to Maria's own embodied experience within them (Hamraie 2013). For Maria, however, the multiple learning spaces in which she learned (home, school, online) were not disconnected; her capability to learn in one space informed her capability, choices, and activities in another. The school's approach reflected an understanding of technology as a discrete, self-contained, ahistorical tool whose primary purpose was to facilitate Maria's independent capability to meet the normative academic and social expectations within predetermined spaces in school. For Maria, however, the potential of technology to deliver access was found to be unambiguously connected to how places, and the people who inhabited those places, were imagined. As Moser and Law (1999) reminds us, the material specificities and their linkages that produce subjectivity are infinite and enmeshed in complex arrangements of human and non-human actors. Accessibility, we may then argue, remains a socio-spatial phenomenon that is only partly derived from the specific affordances of technology.

The findings confirmed recent research in AT that has identified inadequate professional development in this area, erratic leadership in sustaining this as a priority, and the inevitable clash with personal beliefs and values about the suitability of technology for these youth (Wehmeyer et al. 2004). Additionally, it was clear that Maria would also have benefited from being part of a community of AT users that could have permitted knowledge sharing and collective processing. She required opportunities for systematic joint exploration with a knowledgeable partner to surface the minutiae of processes when drawing on multiple technologies for multiple schooling purposes. All too often, the uses of specialized technology are seen as self-evident and the learner is left to 'play' with the technology to learn by trial and error, without adequate facilitation or support. This also means that when the learner is unable to deliver effective use of the technology, (s)he is blamed for not trying hard enough or as in Maria's case, 'making excuses.' All technology use, however, is not intuitive and like many students, Maria's ability to develop academic skills was contingent on timely instruction, reliable supports, and individualized planning (King-Sears & Evmenova 2007). Teachers, too, it seemed, were expected to develop their skills in this area on their own with few opportunities for systematic inquiry (Hollins 2017). Institutional support for teachers' growth and development in the use of technology was not readily evident in this setting.

The requirement for independent bodily functioning as a prerequisite for social/academic success has long been problematized in the research on students with significant disabilities (Ferguson & Baumgart 1991; Kliewer & Biklen 2007, to name a few). Rather, the significance of social/community partners in the emergence of individual capability has been increasingly documented (see, e.g., Biklen [2005] on this important subject). Maria's experience of accessibility within any space was enhanced when the individuals with whom she interacted (teachers, paraprofessionals, peers, non-school youth) afforded her the conditions that allowed her to see herself as capable. In that regard, the label of 'intellectual disability' that likely informed educators' understanding of schooling for Maria and her peers, may well have been irrelevant for Maria's purposes (Kliewer, Biklen & Petersen 2015).

We conclude by identifying a few ways in which understanding accessibility as a socio-spatial phenomenon can benefit practitioners.

- *Firstly*, the use of any technological tool cannot be decoupled from the expectations of learning that are upheld in the spaces in which it will be used. Learning about how students use technology in different in-school and out-of-school social spaces can afford educators clues to spatial features of schooling contexts that require alteration to support student development. In this context, families and, even more importantly, students themselves remain invaluable resources for educators.
- *Secondly*, understanding space as dynamic and evolving rather than as an inert entity, means that places can come to acquire new and different 'identities' (Massey 1994). In other words, regardless of the given narratives of student *incapacity* that circulate within special educational spaces, such spaces still bear potentiality for change. Whether a self-contained classroom or a mainstream space, when educators deliberately enact a set of practices that are capacity-oriented, they can alter the 'identities' of spaces so that students come to experience them in empowering ways.
- *Finally*, technological supports may be less about delivering 'independence' for the user and more about ensuring deeper engagement with the environment. A student's 'capacity' and the 'capability' of the technology are jointly constituted within such embodied experience. Maria, for instance, may be understood as 'student-with-AT.'



So, rather than require students to demonstrate independence in educational tasks, educators might examine how closely the technology is able to reveal new/previously unknown facets of the student. In other words, in what ways does the student's use of technology in the educational space allow him/her to be known in complex ways by the people within that setting? We suggest that this could be a more generative way to assess the potential of technology to ensure accessibility of a given space.

### Competing Interests

The authors have no competing interests to declare.

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