The Five Elements of Technology Accessibility Policy Enactment in K-12:

A Grounded Theory

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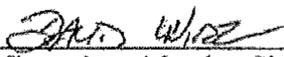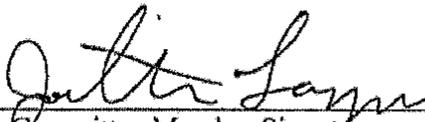
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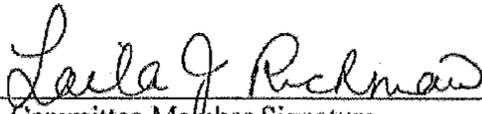
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Abstract

The Five Elements of Technology Accessibility Policy Enactment in K-12:

A Grounded Theory

Natalie L. Shaheen

Over 12 million disabled students attend public K-12 schools in the United States

(U.S.) (U.S. Department of Education, 2019). But, in 2019—when technology is an

increasingly integral component of teaching and learning—many disabled students do not

have full and equal access to K-12 learning environments because the technologies used

therein are inaccessible to them, despite legal requirements for equal access (Perez & Ali,

2010). This constructivist grounded theory study used a policy enactment theoretical

framework to understand how five diverse Local Education Agencies (LEAs) enacted

technology accessibility policy and made meaning of their experience. The resulting

grounded theory explains that technology accessibility policy enactment was an

evolutionary process through which participating LEAs translated abstract policy ideas

into increasingly contextualized local practices—ways of performing technology

accessibility that were congruent with their unique context—in order to more closely

approximate their policy ideal of 100% accessibility. The messy, ongoing process was

composed of five elements: *becoming aware*, *strategizing*, *learning*, *practicing*, and

iterating. Embedded in the evolution of the technology accessibility work was another

evolution in the LEAs' meaning making about (a) their purpose for enacting the policy and (b) their experience engaging with the process. Though LEAs found enacting technology accessibility to be a difficult, overwhelming, frustrating, and time-consuming endeavor, they felt technology accessibility was worth the effort because addressing the issue was imperative to their mission to provide equal education for all. This dissertation argues that additional research and practice is essential to continue integrating technology accessibility into everyday K-12 practice, thereby decreasing the frequency with which disabled students are excluded from technology-enhanced education. Specific recommendations about how the field can move forward are offered, including: (a) creating resources designed for laypeople that address the K-12 context; (b) offering loose frameworks that explain how LEAs could enact the policy, coupled with detailed examples of how others have previously engaged in the work; (c) incorporating technology accessibility into LEA technology procurement processes; and (d) conducting additional research to understand the technology accessibility policy enactment process at different times and in different places.

Keywords: technology accessibility, disability, K-12, technology-enhanced learning, grounded theory, policy enactment, policy, instructional technology

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CHAPTER I:

INTRODUCTION

If you have a commitment to, and a belief that all children can learn, then you

really do have an imperative… It's an essential part of what you're going to do

that says you have to have accessible materials, and that you have to work on

removing barriers. (Tom, Broad Ridge, Interview 2, July 11, 2018)

The United States (U.S.) is home to 12,261,274 disabled students ages 6–21,[1]

7,787,528 of whom receive the majority of their instruction in general education settings

(U.S. Department of Education, 2019). But, in the 21st century—when technology is an

increasingly integral component of teaching and learning—do those millions of disabled

students have full and equal access to the technology-enhanced general education

learning environment? Technology is often touted as a transformational tool that can (a)

make education more equitable, and (b) mitigate disability (Alper, 2017; Selwyn, 2011;

Warschauer, 2004). However, research has shown that the use of technology for teaching

and learning often reinforces and sometimes exacerbates existing inequalities for many

people from marginalized communities (Selwyn, 2011; Warschauer, 2004).

In fact, rather than mitigating disability, the use of technology often erects new

barriers for disabled people (Brown & Brown, 2006; Foley, 2006) because not all

technology is designed for their use (Lazar, Goldstein, & Taylor, 2015; Shneiderman et

al., 2016). When a Kindergarten through 12th grade (K-12) Local Education Agency

(LEA) plans the construction of a new built environment, such as a new school building,

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[1] See the Language Usage section later in this chapter for a discussion of the use of
identity-first disability language in this manuscript.

the legal requirements for making it accessible to disabled people are part of the design process. Ramps and wide doorways are included in the design to ensure the building is accessible to people who use wheelchairs, Braille signage is included to ensure it is accessible to blind people, and fire alarms equipped with strobe lighting are included to ensure it is accessible to Deaf people. These features of accessible built environments are delineated in the implementing regulations of the Americans with Disabilities Act (ADA; 28 C.F.R. § 35-151; 36 C.F.R. § 1191, Appx. B, D), a civil rights law passed in 1990 that prohibits the government and places of public accommodation from discriminating on the basis of disability (42 U.S.C. §§ 12101-12213). Even if the LEA administrator in charge of the construction project is unaware of the ADA requirements to make physical spaces accessible to disabled people, the architects and engineers will ensure that the building plans comply with the legal requirements—since the necessary construction permits will not be granted if the plans are not compliant.

Like built environments, digital environments can be either accessible or inaccessible to disabled people (Brown & Brown, 2006; Istenic Starcic & Bagon, 2014). Moreover, digital K-12 environments, like built environments, are legally required to be accessible to disabled people (Perez & Ali, 2010; U.S. Department of Education, 2011). This raises the question: When a K-12 LEA is considering a new digital environment, such as the adoption of a learning management system or a one-to-one computing initiative, how are the needs of disabled people and the legal requirements for accessibility incorporated into the design and decision-making process?

The literature indicates that a plethora of the technology used in K-12 schools is inaccessible to disabled people (Kamei-Hannan, 2008; National Federation of the Blind,

2015; Riccobono et al., 2015; Riccobono & Rosenblum, 2016; Shaheen & Lohnes Watulak, 2019). This reality prompted the federal government to issue significant policy guidance reminding educational institutions of the legal requirements to use accessible technology (Perez & Ali, 2010; U.S. Department of Education, 2011). Educators' general lack of awareness about technology accessibility and limited understanding of the construct have contributed to the elusiveness of technology accessibility in K-12 education (Hendricks, Wahl, Stull, & Duffield, 2003; Noble, 2005; Wisdom et al., 2007).

Consequently, as technologies are incorporated into K-12 classrooms, disabled students increasingly confront the paradoxical situation in which they can access the physical classroom but not the learning that takes place therein, because the technology that mediates the learning is inaccessible to them (Burdette, Greer, & Woods, 2013; Collins, Green, Nelson, & Madahar, 2015; Perez & Ali, 2010). Over a decade ago, scholars warned that this paradoxical situation was on the horizon: "Although disabled individuals are increasingly accessing the 'regular' education environment, if education is increasingly technology based, there is a real possibility that the inability to access the technology will prevent inclusion" (Brown & Brown, 2006, p. 267). Therefore, as study participant Tom expressed above, and as I argue in chapter 2, technology accessibility is an equity imperative in 21st-century K-12 education because inaccessible technologies inhibit disabled students' learning and deny them full and equal access to education.

Despite this imperative, the combined knowledge base from the fields of education, law, and human computer interaction (HCI) offers little information about how LEAs are incorporating the legal requirements for accessibility into the construction of digital environments in the current educational context. Therefore, this study sought to

construct knowledge about the enactment of technology accessibility policy in K-12 by investigating the technology accessibility policy enactment process at five diverse LEAs in the South and Midwest regions of the U.S. using a constructivist grounded theory (CGT) methodology and a policy enactment theoretical framework (described in more detail in the following section). This chapter begins by situating the study within the broader context of the complex and nuanced sociotechnical endeavor of ensuring disabled students have full and equal access to technology-enhanced education. To provide an overview of the study and the rationale for pursuing this line of inquiry, the remainder of the chapter outlines the problem that led to the inquiry, the purpose of the study, the research questions, the theoretical framework, the researcher's position, the delimitations of the study, and finally the study's significance. Discussion of the language used throughout the manuscript is also presented in the Language Usage and Definition of Terms sections.

Conceptualizing Access to K-12 Instructional Technology

Ensuring that disabled students have full and equal access to technology-enhanced education is a complex and nuanced sociotechnical endeavor that requires LEAs to address numerous aspects of their practice. However, as this section will argue, no existing conception of access fully addresses the complex issue of disabled students' access to technology-enhanced K-12 education. Therefore, I developed a cross-disciplinary composite framework, Accessibility4Inclusion, to provide the missing holistic picture of the complex and nuanced practice. This section provides a brief overview of existing conceptions of disabled people's access to technology and education, and then describes how those conceptions are integrated in the

Accessibility4Inclusion framework. The section concludes with an explanation of the component of this framework addressed in this study.

When considering how to conceptualize access to technology-enhanced K-12 education for disabled students, it is important to understand the constructs and theories about access to technology and education that have emerged from four key fields: HCI, law and policy, instructional technology, and disability studies. Why is each of these fields important to consider when conceptualizing disabled students' access to technology-enhanced K-12 education? The field of HCI deals considerably with issues of interface design and user experience, and the theories of access that emerge from HCI influence the ideas and practices of technology designers and developers, which are then manifested in the K-12 digital instructional environments that they create.

Given that this study deals specifically with access to technology that is incorporated into K-12 instruction, it is critical to include the ways that access is described in the instructional technology scholarship. From the standpoint of practice, instructional technologists also work directly in the classroom with teachers and curricula, and their viewpoints on access are valuable particularly in conversations around the appropriateness of a piece of technology for the classroom. The ways in which access is conceptualized in the law also has bearing on the evaluation of the appropriateness of instructional technology, particularly since K-12 schools are duty bound to adhere to the constructs of access to technology for disabled people that are articulated in federal law (Perez & Ali, 2010; U.S. Department of Education, 2011).

Finally, since this topic deals specifically with disabled people's access to technology, it is essential to incorporate the ways in which disabled people conceptualize

access, ideas that can be found in the disability studies literature. Below, I present a brief summary of the prominent ideas about access to technology that can be gleaned from the fields of HCI, law and policy, instructional technology, and disability studies.

From the field of HCI, three notions about access to technology are prominent:

1. The central concern of accessibility is the characteristics and functionality of mainstream technology and interfaces.

2. Accessible technology must be interoperable with the assistive technologies that disabled people use.

3. Good accessible interfaces are the result of an iterative design process that involves disabled people (International Organization for Standardization, 1997; Lazar et al., 2015; Vanderheiden, 2000).

To HCI scholars, accessible interfaces afford disabled people access to the same functionality with substantially equivalent ease of use at the same time and in the same place as non-disabled people (Lazar et al., 2015).

Technology accessibility has been operationalized in various laws, policies, and guidelines. These laws and policies are built on a conception of access to technology that is congruent with the HCI approach to accessibility. While these policies will be detailed in chapter 2, here it is important to note that Section 508 of the Rehabilitation Act of 1973 (U.S. Access Board, 2017) is one of the key federal policies pertaining to technology accessibility, and it was updated in 2017 (U.S. Access Board, 2017). The new Section 508 regulations are technology agnostic, incorporate the Web Content Accessibility Guidelines (WCAG) 2.0 (Caldwell, Cooper, Reid, & Vanderheiden, 2008), and also follow a functional performance approach (Lazar et al. 2015). The new

regulations shift the legal definition of accessibility in the U.S. from one that exclusively focuses on technology to one that also incorporates users' interactions with interfaces.

Two prominent ideas pertaining to accessing technology and K-12 education emerge from the field of instructional technology. The deep literature on the construct of the digital divide elucidates that access to technology has been fraught with challenges for a wide range of marginalized groups since technology was conceived (Selwyn, 2011; Warschauer, 2002). These ideas have been used to push back against a techno-centric approach that uncritically assumes that technology is always a force for good, and they are used to frame an argument for accessibility as a social justice issue. Second, the growing Universal Design for Learning (UDL) literature conveys that access to instruction for disabled students requires educators to first anticipate and remove barriers to learning, and then use a flexible pedagogical approach (e.g., multiple means of representation, action and expression, and engagement) (Hall, Meyer, & Rose, 2012; Rose, Meyer, & Hitchcock, 2005).

Finally, the field of disability studies has provided three important ideas that help to conceptualize technology accessibility not just as a technical issue, but as a sociotechnical issue that cannot be resolved simply by implementing a technical solution. According to disability studies scholars, access to technology is a complex and nuanced sociotechnical problem that cannot be explained by streamlined linear models of technical innovation (Ellcessor, 2015; Jaeger, 2012, 2014; Jaeger & Burnett, 2010; Kelly et al., 2007). Second, and related to the first idea, models of access to technology must be multifaceted—comprising many components—in order to address the technical, social, and physical aspects of access (Ellcessor, 2015; Jaeger, 2012, 2014; Jaeger & Burnett,

2010; Kelly et al., 2007). Third, concepts of power imbalances and the lived experience

of disabled people should be foregrounded in all discussions of access to technology

(Ellcessor, 2015; Jaeger, 2012, 2014; Jaeger & Burnett, 2010; Kelly et al., 2007).

A Cross-Disciplinary Model of Access

After glancing across the literature in all four fields, two critical gaps are evident.

First, though some cross-disciplinary models of access are available (e.g., Dolmage,

2005; Knoll, 2009; Waitoller & Thorius, 2016), no model of access to technology exists

that incorporates ideas from all four fields. Second, no model exists that specifically

addresses disabled students' access to technology within the K-12 education setting. A

cross-disciplinary model of access is needed to begin addressing the complex problem of

social inclusion in the digital age within the deep-rooted public institution of K-12

education.

As articulated earlier in this section, to adequately address the topic of disabled

students' access to K-12 technology-enhanced education, it is necessary to integrate

knowledge from the fields of HCI, law and policy, instructional technology, and

disability studies. Since the existing models of access to technology do not integrate

knowledge from these four fields, I developed a cross-disciplinary model of access to

technology-enhanced education that specifically addresses K-12 and disabled students.

The model, a cross-disciplinary composite framework called Accessibility4Inclusion,

attempts to address the messy interactions between humans, technologies, cultures, and

social structures.

The name Accessibility4Inclusion emphasizes three key characteristics of the

framework. First, the term "accessibility" is used to connect the framework to the

language of accessibility and the disability cultures that developed that language to (a)

challenge normative technologies and the normative practices that perpetuate their use,

and (b) establish access to media as a civil right (Elcessor, 2015). Second, the phrase "for

inclusion" reveals the goal of the framework: the social inclusion of disabled students.

Third, the use of the numeral "4" symbolizes the integration of constructs and theories of

access from the four domains of HCI, law and policy, instructional technology, and

disability studies. It is worth noting that the framework intentionally avoids using the

term "universal," as this term and the associated ideas are viewed as problematic by

many disability studies scholars (Dolmage, 2005, 2015; Ellcessor, 2010, 2015; Glazatov,

2012; Hamraie, 2012; Knoll, 2009; Voithofer & Foley, 2007; Waitoller & Thorius,

2016).

The composite framework is informed by ideas and constructs from all four

disciplines, incorporating some constructs in whole and others in part. The

Accessibility4Inclusion diagram, depicted in Figure 1, illustrates the relationship between

the various constructs that comprise the framework. The A3 model of accessibility

(Edyburn, 2005) informed the organization of this framework, delineating the complex

practice into three key elements: *accessibility*, *advocacy*, and *accommodation*; however,

the details of each element of practice are informed by other theories. The structure and

arrangement of the framework is informed by process-oriented models of access, such as

those hailing from disability studies, as well as the iterative design philosophy of

usability and other HCI practices (Dolmage, 2005; Shneiderman et al., 2016). The

framework features three circles arranged equidistant from one another in a triangular

configuration with semicircular two-way arrows connecting the three elements. The three

circles are labeled *accessibility*, *advocacy*, and *accommodation*. The two-way arrows emphasize that accessibility is an iterative, "always beta" process, not a checklist or set of steps with an obvious conclusion. This iterative, process-oriented approach is critical because technological development is far from stagnant. Just as educators are in a constant state of iteration working to develop effective methods for leveraging the affordances of technology to bolster instructional practices, the same iterative attention must be paid to the social inclusion of disabled students as technology continues to change.

Looking more closely at the three key elements of the framework—*accessibility*, *advocacy*, and *accommodation*—the incorporation of other existing theories of access is apparent. Zooming in on the largest of the three circles, *accessibility*, one can see the influence of the information worlds theory (Jaeger, 2012) in the subdivision of the practice into three equal wedges: *physical*, *intellectual*, and *social*. The framework suggests that physical access is accomplished through the use of the legal (i.e., the new Section 508 regulations) and HCI conceptions of accessibility (Lazar et al., 2015). Intellectual access, the framework recommends, can be achieved through the use of UDL (Hall et al., 2012). Finally, the framework proposes that in order to achieve social access, the nuanced intersectional understandings of disability and the critical examination of able-bodied power and privilege that arise from disability studies must be incorporated. All three wedges of the circle are necessary to have true accessibility. Physical access is necessary, but not sufficient (Edyburn, 2005; Jaeger, 2012); intellectual access is critical in schools but cannot happen without physical access; and to achieve social inclusion in the school environment, one must also have social access.
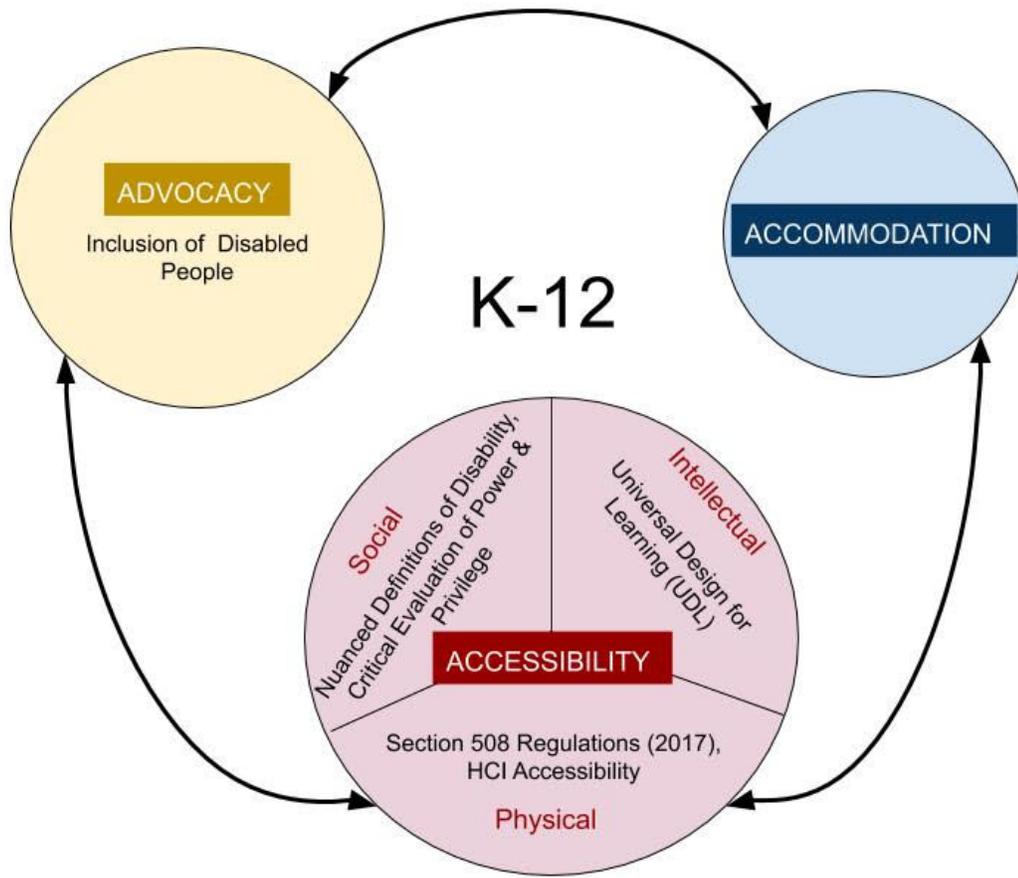
Figure 1. Accessibility4Inclusion diagram. This illustration demonstrates the relationships between the various constructs that comprise the cross-disciplinary framework of disabled students' access to technology in K-12 education.

The medium-sized circle, *advocacy*, highlights the critical role that disabled people (young and old) play in the process of access for social inclusion. For decades, one of the mottos of the disability rights movement has been "nothing about us without us" (Davis, 2013), meaning that initiatives dealing with disability must include disabled

people. To remain authentic to the lived experiences of disabled people, it is critical to value and include the voices of disabled community members in the process of accessibility. The importance of including disabled people in the process can be seen in current HCI best practices for developing and evaluating accessible and usable interfaces (Lazar et al., 2015), as well as models of access that hail from disability studies (Dolmage, 2005, 2015; Kelly et al., 2007).

By including the smallest of the three circles, *accommodation*, the framework acknowledges that individual experiences are unique, and that some people and some instances may require accommodation in addition to accessibility, an idea that has been advanced by some disability studies scholars (Knoll, 2009; Lewthwaite, 2014). Accommodations might include additional assistive technologies, the addition of a physical intervention (e.g., paper tactile graphics or physical manipulatives), or the aid of a human assistant (Lewthwaite, 2014). However, accommodation should not be viewed, within the boundaries of this framework, as a replacement for or alternative to accessibility. In other words, it would be incongruent with this framework for a school to adopt a technology that was not physically accessible to disabled students (i.e., did not conform to the updated Section 508 regulations) and then provide the accommodation of a human aide as a way to circumvent the physically inaccessible technology. Rather, accommodation should be viewed as a way to further support and scaffold a student's learning when accessibility (i.e., physical, intellectual, and social) alone is insufficient.

Finally, in the middle of the framework, at the heart of the triangular configuration, is the label *K-12*. This label situates the framework within the messy context of K-12 education and all of its associated affordances and limitations.

Furthermore, it is a reminder that the goal is to include disabled K-12 students, who have their own unique lived experiences that are different from those of disabled adults. Disabled students, like their non-disabled peers, may not yet have fully developed identities and, as a result, may need greater support for social access than disabled adults. Furthermore, disabled students are often still learning the alternative techniques (e.g., assistive technology skills, etc.) that disabled adults have mastered. As a result, the technical standards, such as the updated Section 508 regulations, which guide the assurance of physical access, may not be sufficient on their own to ensure physical access for disabled youth whose alternative skills are still in development.

Accessibility4Inclusion provides a complete picture of the complex and nuanced work of ensuring disabled students have full and equal access to technology-enhanced education. To begin to investigate this sociotechnical practice, this study focused on one component of the work: physical access to technology. While all components of the framework are necessary for disabled students to have full and equal access to technology-enhanced education, physical access to the technology, which resides at the bottom of the framework, is the most fundamental element. If disabled students cannot physically access a technology (e.g., navigate and interact with the interface), all other forms of access are irrelevant, just as all other forms of access are irrelevant in an analog environment if the building is physically inaccessible to disabled students. Therefore, given the dearth of literature on the topic of technology accessibility in K-12, this study focused on the work LEAs are doing to ensure that their technologies are physically accessible to their disabled students.

Problem and Purpose Statements

Today, disabled students are increasingly included in technology-enhanced

general education classes. Unfortunately, however, not all technology is developed to be

accessible to all people (Lazar et. al., 2015). In fact, the needs of disabled people are

often neglected in the development of technologies; consequently, a great deal of

technology is inaccessible to disabled people, including technology that is used in K-12

education. In order for technology-enhanced K-12 education to be inclusive of disabled

students, the technologies used in the learning environment must be accessible (Brown &

Brown, 2006). Ensuring technology-enhanced learning environments are accessible to

disabled students requires the same intentional effort as ensuring analog learning

environments (e.g., school buildings) are accessible. Since inaccessible environments

pose a significant barrier to disabled Americans, federal law requires that educational

institutions, among others, are intentional when designing analog and digital

environments to ensure that they are accessible to disabled people (Perez & Ali, 2010;

U.S. Department of Education, 2011; *see* 28 C.F.R. § 35.160; *see generally* 34 C.F.R.

Part 104 (d)(1)).

As detailed in the next chapter, literature from the early 2000s indicates that the

existence of technology accessibility policy does not automatically translate into practice

in K-12. Even after the passage of federal and state laws specifically pertaining to

technology accessibility, many educators remained unaware of the policies (Noble, 2005;

Wisdom et al, 2007), resulting in LEAs that did not address technology accessibility.

After noticing that LEAs were not engaging in the intentional work of ensuring their

technologies were accessible, four states developed initiatives to encourage and support

LEAs in addressing technology accessibility (Hendricks et al., 2003; Kaplan, Weiss, & Allen, 2006; Noble, 2005; Peterson, 2005). As a result, in the early 2000s, some LEAs in Kentucky, New Mexico, Maryland, and South Carolina began the intentional work of ensuring their technology-enhanced learning environments were inclusive of and accessible to disabled students.

The literature offers a helpful historical perspective about the enactment of technology accessibility policy in K-12. However, the knowledge developed in the beginning of the 21st century pertains to work that took place among state-level actors, such as state departments of education, to encourage LEAs, rather than focusing on understanding the work that occurred within the LEAs themselves. Moreover, the literature offers little information about the state of technology accessibility in K-12 today, save for evidence that inaccessible technologies are still being used in K-12 (Shaheen & Lohnes Watulak, 2019). In the current educational context, where technology is used even more extensively than it was over a decade ago, what are LEAs doing to address technology accessibility and enact the associated policies?

Research Questions

The purpose of this CGT study was to understand how five diverse LEAs (a) enacted technology accessibility policy during the 2018 calendar year, and (b) made meaning of their experience. Specifically, the three research questions that guided this study were:

1. What is the process by which K-12 LEAs enact technology accessibility policy?

2. How does that process unfold, and why does the process unfold as it does?

3. How do LEAs engaged in the process make meaning of the experience of enacting technology accessibility policy?

Theoretical Framework: Policy Enactment

The ways in which LEAs take up policy, specifically technology accessibility policy, were central to this study. Consequently, the study required a theoretical framework pertaining to policy uptake. This section provides a brief description of the three generations of theories pertaining to policy uptake that are evident in the policy analysis literature, and concludes with the rationale for employing policy enactment as the theoretical framework in this study.

Since its establishment in the 1960s (Odden, 1991; Sutton & Levinson, 2001), the interdisciplinary domain of policy analysis has conceptualized the uptake of policy in two primary ways. The first and second generation of policy analysis research was policy-centric, focusing primarily on top-down policy implementation (Barrett, 2004; deLeon & deLeon, 2002; Odden, 1991). The third generation of policy analysis, particularly critical policy analysis conducted in the field of education, saw a shift to more complex and nuanced process-oriented approaches, such as policy enactment (Barrett, 2004; deLeon & deLeon, 2002). These two theoretical approaches to policy research (implementation and enactment) differ in: (a) their philosophical underpinnings, (b) their definitions of policy, (c) their assumptions about the roles of various actors, (d) their conceptualizations of policy processes, and (e) the purposes or aims of their work. This section delineates the differences between the two approaches and then provides the rationale for employing policy enactment as the theoretical framework in this study.

Policy implementation research has its foundations in a positivist worldview, wherein reality is understood to be objective, singular, and external to the self (Creswell, 2013). Following from that philosophical perspective, policy implementation scholars define policy as text that represents a decision made by the formal government, often as the answer to a problem (Ball, Maguire, & Braun, 2012; Barrett, 2004; Mazmanian & Sabatier, 1989). Accordingly, the government is seen as the principal authoritarian actor, and those on the front lines, who are tasked with implementing the policies, are seen solely as a homogeneous group of agents who need only to read, understand, and follow the policy as delivered by the government (Ball et al., 2012; Barrett, 2004; deLeon & deLeon, 2002; Mazmanian & Sabatier, 1989; Spillane, Reiser, & Reimer, 2002). Policy implementation, then, is seen as a top-down linear process where "policies are slipped or filtered into place, either 'successfully' or 'unsuccessfully'" (Ball et al., 2012, p. 5; Sutton & Levinson, 2001). Therefore, the aim of policy implementation research is either to (a) evaluate the success of an implementation and the subsequent reshaping of behavior, or (b) understand the barriers to and catalysts for successful implementation with the goal of developing an efficient model for implementing policy (Barrett, 2004; deLeon & deLeon, 2002; Levinson, Sutton, & Winstead, 2009; Taylor, Rizvi, Lingard, & Henry, 1997).

The field of policy analysis has evolved since the early days of top-down policy implementation research and now includes theories about policy uptake that are rooted in different worldviews and, thus, advocate a dramatically different conception. Policy enactment research in the U.S. tends to be grounded in an interpretivist worldview, wherein reality is multiple and context dependent (Merriam, 2009; Taylor et al., 1997). In

the United Kingdom (U.K.) and Australia, policy enactment research is often grounded in a critical theory worldview, wherein reality, in addition to being multiple, is situated in various contexts (i.e., political, social, cultural) and one reality is privileged over others (Merriam, 2009; Taylor et al., 1997). From these worldviews, policy enactment scholars in the U.S. and abroad define policy as both texts and discursive processes (Ball et al., 2012). Ball explains: "…policy is not one or the other, but both, they are 'implicit in each other.' Policy discourses… produce frameworks of sense and obviousness with which policy is thought, talked and written about" (1993, p. 44).

Policy enactment scholars further conceptualize policy as existing in a state of constant change or becoming; policies are continually being interpreted and translated. Policies only limit one's choices in determining how to act; they do not tell one exactly what actions to take (Ball, 1993, 1994). Unlike policy implementation, policy enactment conceptualizes educators, and others on the front lines, as heterogeneous policy actors who are integral to the enactment process (Hodgson, Edward, & Gregson, 2007). Therefore, policy enactment is theorized as an ongoing, nonlinear process whereby diverse policy actors engage in "creative processes of interpretation and recontextualization" (Braun, Maguire, & Ball, 2010, p. 549) to transform "the abstractions of policy ideas into contextualized practices" (p. 549). In policy enactment, context is paramount; therefore, the aim of enactment research is to understand and describe the messy and complex process by which diverse policy actors (including educators) enact policies in their unique contexts.

As mentioned, this study employed policy enactment as its theoretical framework. Policy enactment has been widely used as a theoretical framework in

education policy studies both in the U.S. and abroad (e.g., Braun et al., 2010; Hardy, 2014; Keddie, 2013). Moreover, policy enactment and appropriation have been used as theoretical frameworks for U.S. education policy analysis dealing with concerns of disability (e.g., Tefera & Voulgarides, 2016; Thorius & Maxcy, 2015; Thorius, Maxcy, Macey, & Cox, 2014), and some scholars have called for future special education policy research to take a critical policy analysis approach (Thorius & Maxcy, 2015).

Based on the precedents set by other scholars, a policy enactment approach was appropriate for this study due to its settings, as well as the specific policy concerns on which it focused. As Ball and colleagues explained, "schools are complex and sometimes incoherent social assemblages" (2012, p. 2), and no two schools represent the same type of complex setting. Therefore, top-down linear approaches to policy analysis are ill-suited for educational policy analysis. In addition to the inherent complexity of schools, K-12 education is burdened with policies that compete for attention and sometimes conflict with one another (Braun et al., 2010; Marsh, 2016). This is particularly true in special education, as special and general education policies from the federal government at times contradict one another (Thorius & Maxcy, 2015).

Therefore, the dynamic nonlinear framework of policy enactment, which acknowledges educators as key policy actors and foregrounds the messy context of schools in the conceptualization of policy uptake, was essential to understanding how K-12 LEAs engage with technology accessibility policy. Technology accessibility mandates arise from several federal statutes as well as state statutes and regulations (see chapter 2 for an in-depth discussion). Moreover, technology accessibility statutes are enacted in the same space and time as other policies pertaining to the use of technology in

schools, which further complicates the process and renders streamlined top-down

frameworks, like policy implementation, impractical. This study required a theoretical

framework equipped to account for (a) the complexity of the K-12 LEA context, (b) the

multiple sources of technology accessibility policy, and (c) the turbulence of the 21st-

century K-12 policy landscape. Policy enactment was the only approach to policy

analysis that met these three criteria, and was therefore the theoretical framework

employed in this research.

Researcher Position Statement

In qualitative research, it is critical for readers to know the position from which

the researcher approached the study because the researcher is the primary instrument of

data collection and analysis (Merriam, 2009). Qualitative research acknowledges the

subjectivity inherent in this approach, and suggests that researcher transparency is one

method for supporting the trustworthiness of the research. This section provides the

requisite transparency, outlining the position from which I approached the study. I

identify as a disabled person, an advocate, and a teacher; these aspects of my identity

give rise to my interest in K-12 technology accessibility and in this research specifically.

Wrapped up in my identity, which has developed over the years through my personal and

professional experiences, are the beliefs that guide my practice and helped shape this

project.

I have been blind since birth. I was raised by parents who created an environment

that fostered my affirmation of blindness as a positive part of my identity, and taught me

that as a disabled American, I had, under the law, all of the same rights as my able-bodied

peers. From my lived experience as a disabled child, I developed the beliefs that (a)

disability identity can be a point of pride, (b) disabled people have the legal and ethical right of equal access to all aspects of American life (i.e., school, work, community), and (c) that the law is a useful tool for defending disabled people's right to equal access. These beliefs have guided my professional practice as a teacher, in which I have repeatedly defended my students' rights to access all aspects of the K-12 learning environment. Moreover, these beliefs have helped to focus this research on disabled students' equal access to technology-enhanced learning environments and the role that policy plays in accomplishing that goal.

Another belief that has roots in my childhood and has been further refined by my professional experience is that, when used intentionally, technology can bolster the learning opportunities available to students, particularly disabled students. I came to value technology at a very young age, having grown up using it at home and at school as a tool for learning, communicating, and producing work. My belief in the value of technology to support learning was later refined when I entered the classroom as a novice teacher. I began my career in the mid-2000s at a school where instructional technology was prominent; for example, every classroom had an interactive whiteboard, an emerging technology at the time.

Collaborating with the veteran teachers in my department and experimenting with my own ideas, I figured out how to enhance the learning opportunities available to my disabled students by using a combination of instructional and assistive technologies. As my career progressed and I continued to use a combination of technologies as a part of my teaching practice, I sought out information about the instructional technologies that were on the horizon. As I had the opportunity to work with the newer technologies,

particularly mobile apps and Web 2.0 tools, I realized that most of them were not compatible with the assistive technology my students used—these new technologies were inaccessible. Therefore, I could not use the newest technology in my teaching practice with disabled students. Two of my strong beliefs were in conflict: I saw the value in the affordances of the new instructional technologies, but those same technologies barred my disabled students from full and equal access. Fortunately, not long after I confronted this dissonance, I became involved in the advocacy work of the disability rights movement where I met knowledgeable disabled people who taught me that emerging technology and full access for disabled people are not mutually exclusive ideas. In fact, I learned, emerging technologies can facilitate full access by disabled people if they are built properly—if they are born accessible.

My beliefs coupled with my lived experience as a blind teacher and advocate led me to be enthralled with the cause of ensuring disabled students have full and equal access to technology-enhanced K-12 education. I wondered how disabled people, advocates, K-12 stakeholders, academics, and policy makers could work together to ensure that disabled students continue to have full and equal access to K-12 education as technology becomes an increasingly integral component of teaching and learning. One body of knowledge that would bolster understanding and facilitate collaboration between these groups is information about how LEAs address technology accessibility, and specifically how they enact existing policies. Consequently, I embarked on this research to begin developing an empirical understanding of the state of technology accessibility work in K-12 education.

The position from which I approached this research influenced not only the study design, but also the language I use in this manuscript. The impact of my position on language usage is most noticeable in the disability language convention I have employed, and the following section provides the rationale for these disability language choices.

Language Usage

Professional and cultural norms influence the ways in which language is used. In the field of education in the U.S., professional and cultural norms encourage the use of person-first language (e.g., "person with a disability" instead of "disabled person"). In fact, the person-first language convention is required by the American Psychological Association style guide (2010). Despite the popularity of person-first language in the field of education and the broader U.S. culture, where the majority of people are able-bodied, this convention is not fully supported by disabled people. In fact, many disabled scholars and activists vehemently oppose the use of person-first language (Brueggemann, 2013; Davis, 2013; Dunn & Andrews, 2015; Longmore, 2003), arguing that the terminology "implies that disability is somehow a diminished aspect of the self, rather than an aspect of identity that is a source of pride" (Foley & Ferri, 2012, p. 192). Disabled people have expressed their opposition to the use of person-first language since at least the early 1990s. For example, the National Federation of the Blind passed a resolution in 1993 rejecting the use of person-first terminology; Deaf and autistic people have expressed similar positions (Brown, 2011; Dunn & Andrews, 2015).

I join many disabled scholars in rejecting person-first language; throughout this dissertation, I use identity-first language. In this convention, adjectives that describe disability are used in the same manner as other positive adjectives are used to describe

people (e.g., "disabled person" is a construction analogous to "strong person"). This convention serves (a) to recognize that disability, like other identities, is a point of pride, and as such should be afforded the same syntax; and (b) to interrogate the power that the able-bodied majority has to prescribe the syntax used in disability discourse (Dunn & Andrews, 2015).

While I have adopted identity-first language, I recognize and respect that this convention, like person-first language, is not supported by everyone in the field of education or in the disability community. In this qualitative study, I endeavor to represent participants' experiences, and therefore my voice is not the only one represented in this manuscript. Participants in this study primarily used person-first language, though a few participants used the two conventions interchangeably. In sharing participants' stories, I have respected their voices and choice of language; therefore, quotes and other representations use whatever disability language participants employed (e.g., person-first or identity-first).

Definition of Terms

This section continues the discussion of language by offering definitions for several words and concepts that are central to this study.

Disability: This study incorporates the definition of disability advanced by Kafer (2013) in her political relational model of disability. This model was developed as a modest departure from the social model of disability with the intention of calling into question some of the ideas that have become "givens" under the social model (Kafer, 2013). For example, the political relational model rejects the impairment/disability dualism that is central to the social model, asserting that both impairment and disability

are social in nature, and that by minimizing the role of impairment, the construct devalues the lived, sometimes painful, experiences of impaired individuals (Kafer, 2013).

In the political relational model, disability is viewed as a "political category rather than as an individual pathology" (Kafer, 2013, p. 14). By positioning disability as a political category, Kafer emphasized the political nature of disability and the power dynamics inherent therein, and she acknowledged activist work as a mechanism for critiquing the politics of disability. Kafer (2013) further positioned disability as relational; therefore, disability is understood to be inextricably linked to able-bodiedness. In other words, one cannot define disability without simultaneously defining what it means to be able-bodied. Therefore, in the political relational model of disability, the problem of disability is understood to be the built and digital environments as well as their inherent cultural patterns that "exclude or stigmatize particular kinds of bodies, minds, or ways of being" (Kafer, 2013, p. 6).

Local Education Agency (LEA): This research employs the definition of LEA that appears in the Elementary and Secondary Education Act of 1965 (as amended by the Every Student Succeeds Act of 2015), which reads:

> The term "local educational agency" means a public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary schools or secondary schools in a city, county, township, school district, or other political subdivision of a State, or of or for a combination of school districts or counties that is recognized in a State as an administrative agency for its public elementary schools or secondary schools (20 U.S.C. § 7801(30)(A)).

In addition to the legal definition, LEAs are further conceptualized as being co-constitutive of their employees (Billett, 2008; Imants, Wubbels, & Vermunt, 2013; Lee & Roth, 2007). That is, LEAs do not exist apart from the people they employ, nor do employees exist apart from the LEAs for whom they work. Therefore, in this manuscript, the term "LEA" is meant to simultaneously refer to both the organizations and their employees, as the two cannot be separated.

Policy: For the purpose of this research, following the policy enactment theoretical framework, policy will be defined as both texts and discursive processes (Ball et al., 2012). Ball (1993) explained that "… policy is not one or the other, but both, they are 'implicit in each other.' Policy discourses… produce frameworks of sense and obviousness with which policy is thought, talked and written about" (Ball, 1993, p. 44). Consequently, federal and state laws are viewed as policy in the context of this research, but so, too, are other texts and the practices that surround those texts. Furthermore, in this research, policy is conceptualized as being in a constant state of becoming, as it is continually interpreted and translated by different policy actors (Ball, 1993, 1994).

Technology accessibility: This term refers to a construct that examines the level of access disabled people have to technology—namely, whether the level of access afforded to disabled people is equivalent to that afforded to non-disabled people (Lazar et al., 2015). Accordingly, "accessible technology" is understood as providing disabled and non-disabled people substantially equivalent ease of use at the same time and in the same place. Conversely, "inaccessible technology" is understood to neglect the needs of disabled users and to erect barriers to use.

Web accessibility: Web accessibility is a specific type of technology accessibility, described above, that addresses web-based technologies (e.g., websites).

Delimitations

This study was bounded in several ways. First, the research was conducted during the 2018 calendar year. Given that this study aimed to develop a theory about the process by which LEAs enacted technology accessibility policy, to be included in this research, LEAs had to be engaged in the enactment of technology accessibility policy during the 2018 calendar year and participants had to be actively engaged in the enactment process at their LEA. LEA employees who were not identified by the LEA as actively involved in the enactment process did not participate in this research.

The aim of this research was not to evaluate, but, rather, to understand and explain the process of technology accessibility policy enactment. Therefore, this research did not assess the effectiveness or fidelity of participating LEAs' enactment of the policy. Before one can assess the effectiveness or fidelity of technology accessibility policy enactment, one must first understand all of the complexities of that process in different locales. The literature elucidates how various LEA demographics (e.g., size, structure, leadership, student population, etc.) influence how policies are enacted (Durand, Lawson, Wilcox, & Schiller, 2016; Fullan, 1994; Seese, Madaus, Bray, & Kehle, 2007; Spillane, 1998). With a greater understanding of the ways that LEAs achieve the goal of full access to technology-enhanced learning for disabled students, which this study endeavors to provide, the field will be in a better position to begin examining the fidelity of LEA enactment of technology accessibility policy.

Significance of the Study

As discussed earlier, technology accessibility is an equity imperative because inaccessible technologies inhibit disabled students' learning by excluding them from technology-enhanced education. This study contributes to the knowledge base about this equity imperative in two significant ways. First, the study provides an empirical explanation of the work that LEAs are currently doing to enact technology accessibility policy. Second, the study reveals that LEAs are at various stages in the evolution of their technology accessibility policy enactment process, and none of the LEAs felt their work was complete; they had not yet reached their policy ideal of 100% accessibility. Therefore, additional research and practice is essential to continue integrating technology accessibility into everyday K-12 practice, thereby decreasing the frequency with which disabled students are excluded from technology-enhanced education.

The study also makes specific contributions to scholarship, practice, and policy. The contributions to scholarship include: (a) a substantive theory, grounded in data from participants, explaining the process of technology accessibility policy enactment at five diverse LEAs during a unique and historically significant policy context, which fills an identified gap in the literature; (b) insight into the critical roles that context, knowledge, and interpretation play in the enactment of technology accessibility policy; and (c) an appeal for additional research and guidance about the type of research that would be most beneficial.

This study also contributes knowledge that K-12 practitioners can use to reflect on their current practice and to inform their future practice in two specific ways. First,

practitioners can examine the knowledge they already have, and identify knowledge they may still need to develop in order to continue (or begin) enacting technology accessibility. Second, practitioners can examine how their context mediates (or will mediate) their enactment process and how they can continue (or begin) developing technology accessibility practices that are congruent with their specific context in order to sustain their ongoing technology accessibility efforts.

Finally, the study contributes to policy by offering government officials and policy advocates insight into how LEAs interpret and enact technology accessibility policy. Specifically: (a) policy does not automatically translate into practice—LEAs must first be made aware of the policy, and many K-12 educators remain unaware; (b) LEAs often interpret technology accessibility policy as applying exclusively to websites; and (c) the enactment process will look different in each LEA given the mediating function of context. In sum, the findings of this study indicate that some useful work to address technology accessibility is occurring in K-12; however, additional work is needed to ensure that disabled students have full and equal access to technology-enhanced education.

Chapter I Summary

This chapter situated the study discussed herein within the current educational context, described the complex and nuanced sociotechnical endeavor of ensuring disabled students have full and equal access to technology-enhanced education, and identified the one piece of that complex and nuanced endeavor that this study addressed. Next, it provided an overview of the study, including the research questions and theoretical

framework, and the rationale for pursuing this line of inquiry. Chapter 2 will provide an in-depth examination of the relevant literature and identify the gaps in the literature that this study addresses.

CHAPTER II

LITERATURE REVIEW

In chapter 1, I provided an overview of and rationale for the present study. To provide additional context, this chapter situates the present study in the literature, synthesizing evidence from a review that traversed the fields of education, law, HCI, and disability rights. From the evidence in the literature, this chapter argues that (a) technology accessibility is a 21st-century equity imperative that K-12 LEAs should address, and (b) to do so LEAs must engage in the complex process of technology accessibility policy enactment, but (c) the literature does not provide any insight into the enactment of technology accessibility policy in the current K-12 education context. Therefore, additional research is needed to support stakeholders in making research-informed decisions about enacting technology accessibility policy.

Below, I begin by addressing why technology accessibility is significant in the field of K-12 education, demonstrating that technology accessibility is a 21st-century equity imperative that LEAs should address. Next, I examine the literature to discern what is known about K-12 technology accessibility discourse and practice. I conclude by revealing gaps in the literature and explaining how the present study can inform future work in K-12 to enact technology accessibility policy and bolster the knowledge base.

Methodology

In a recent systematic review of the literature that examined technology accessibility in K-12 (Shaheen & Lohnes Watulak, 2019), I identified a small corpus of 17 articles on the topic published between 2003 and 2018. The small number of articles is likely the result of researchers' focus on technology accessibility in higher education,

government, and the private sector. In addition to the small corpus, the majority of the articles identified through the review (n = 10) were published prior to 2007 and only three of the articles were published after 2014. In order to ensure that I captured and included all of the relevant literature on technology accessibility in this new review, I integrated sources from four additional locales with the sources surfaced in the 2019 review. The four additional locales were: education, specifically the disciplines of special education and instructional technology; law, specifically case law, statutory law, and litigation; HCI; and primary sources from recent disability rights work that has occurred around technology accessibility. This broader scope resulted in a total corpus of 56 sources.

The body of the review is divided into three parts: the significance of technology accessibility in K-12, K-12 technology accessibility discourse and practice, and advancing K-12 technology accessibility. I conclude with an argument that the literature does not provide any insight into the enactment of technology accessibility policy in the current K-12 education context. Therefore, additional research is needed to support stakeholders in making research-informed decisions about enacting technology accessibility policy.

The Significance of Technology Accessibility in K-12

The literature suggests that technology accessibility is a 21st-century equity imperative that K-12 LEAs should address. Below, I draw on the literature to describe the conditions of the current education landscape that make technology accessibility an urgent matter. I conclude the section by explaining why addressing technology accessibility is a prudent course of action for K-12 LEAs.

A 21st-Century Equity Imperative

In 2019, disabled students increasingly confront the paradoxical situation in which they can access the physical classroom but not the learning that takes place therein because the technology that mediates the learning is inaccessible. Over a decade ago, Brown and Brown expressed their fear that such a paradox might be on the horizon: "Although disabled individuals are increasingly accessing the 'regular' education environment, if education is increasingly technology based, there is a real possibility that the inability to access the technology will prevent inclusion" (2006, p. 267). To understand how this paradox occurs, one must first understand that not all technology works for all people.

Lazar and his colleagues (2015) explained that many technology developers do not design technology that is usable by all people—particularly disabled people—because many developers have historically assumed that all users share their demographic characteristics and lived experience (Shneiderman et al., 2016). By default, the resulting inaccessible technologies pose barriers for disabled people, making it more difficult—and sometimes impossible—to complete a task, both in and outside of school. In education, for example, a study that examined the accessibility of a computer-adapted test in K-12 found that accessibility barriers rendered 20.55% of test questions unanswerable by disabled students using assistive technology (AT) (Kamei-Hannan, 2008). A study of three e-reader platforms found that two of the three platforms did not offer any accessibility features, and as a result could not be used by disabled students (Maatta & Bonnici, 2014). Inaccessible technology erects barriers and thus inhibits disabled students' learning. Consequently, when inaccessible technology is used in K-12, disabled

students are denied full and equal access to education (Hashey & Stahl, 2014). Therefore, accessible technology is essential for equitable 21st-century learning—a claim supported by federal law and federal policy guidance, which will be discussed later in the chapter.

Not only is technology accessibility an equity concern, it is an urgent matter, given that technology is becoming an increasingly integral part of K-12 education (Burdette et al., 2013; Collins et al., 2015; Hashey & Stahl, 2014; Kimmons, 2015; State Educational Technology Directors Association, 2010). The Horizon Report, which follows annual instructional technology trends in K-12, indicated that makerspaces and robotics are currently being adopted by K-12 schools and predicted that virtual reality is likely to be adopted over the next three years (Freeman, Adams Becker, Cummins, Davis, & Hall Giesinger, 2017). Previous versions of the report predicted that online learning and 3-D printing technologies, among others, would be adopted in K-12 (Adams Becker, Freeman, Giesinger Hall, Cummins, & Yuhnke, 2016; Johnson, Adams Becker, Estrada, & Freeman, 2015). Many of these technologies, as well as those that are predicted to be adopted by K-12 schools over the next several years, are known to pose potential accessibility barriers to disabled people (Asuncion et al., 2010; Buehler, Kane, & Hurst, 2014; Hashey & Stahl, 2014; Moeller, Bastiansen, Gates, & Subramaniam, 2015; Vanderheiden & Mendenhall, 1994). For example, when not intentionally designed to be accessible, makerspaces exclude disabled people from participating due to the use of inaccessible technology and the inaccessible layout of the physical spaces (Alper, 2013; Meissner et al., 2017; Miele, 2017; Moeller et al., 2015).

However, when accessibility is addressed in the development and implementation of technology, disabled people have full and equal access to the technology and thereby

the associated learning (Buehler, Kane, & Hurst, 2014; Meissner et al., 2017; Miele, 2017; Moeller et al., 2015; Thieme, Morrison, Villar, Grayson, & Lindley, 2017). The work that the District of Columbia Public Library undertook to design an inclusive and accessible makerspace that encouraged the participation of disabled and non-disabled makers alike is one exemplar of the intentional implementation of technologies to promote equity (Moeller et al., 2015; Timony, 2015). To integrate technologies in a way that creates equitable learning environments, attention must be paid to technology accessibility. Therefore, technology accessibility is a 21st-century equity imperative in K-12, because (a) inaccessible technology excludes disabled learners, and (b) K-12 schools are increasingly adopting technologies, many of which have the potential to be inaccessible.

A Prudent Course of Action

To ensure that K-12 LEAs do not unintentionally create inequalities in their learning environments as they adopt technologies, LEAs need to begin addressing technology accessibility. The literature demonstrates that addressing technology accessibility is a prudent course of action for LEAs because the use of inaccessible technology (a) thwarts inclusion efforts, (b) leaves LEAs vulnerable to legal claims of disability discrimination, and (c) depletes LEA resources.

Thwarts inclusion. Over the last few decades, K-12 LEAs have put effort into creating inclusive classrooms where disabled and non-disabled students can learn together. The work to create inclusive learning environments is the result of amendments to the Individuals with Disabilities Education Act (IDEA), which require that disabled students be educated in their least restrictive environment, a determination that must

begin by considering placement in an inclusive general education setting (20 U.S.C. §

1412(a)(5)(A)). Research has shown that the number of disabled students who are

educated in an inclusive learning environment has increased dramatically since 1990

(McLeskey, Landers, Williamson, & Hoppey, 2012; Morningstar, Kurth, & Johnson,

2017; Williamson, McLeskey, & Rentz, 2006). McLeskey and colleagues (2012) found a

93% increase from 1990 to 2008 in the number of students with high-incidence

disabilities who spent at least 80% of the day in general education classes. The most

recent data from the U.S. Department of Education indicates that during the 2017–2018

school year, 63.5% ($n = 7,787,528$) of disabled students ages 6–21 in the U.S. received

80% or more of their instruction in general education settings (U.S. Department of

Education, 2019).

However, the fact that disabled students are educated in general education classes

does not automatically mean that disabled students have equal access to the learning that

occurs therein (Kurz et al., 2014). As discussed previously, inaccessible technologies

erect barriers and exclude disabled learners. Consequently, integrating inaccessible

technologies into K-12 learning environments thwarts inclusion efforts because disabled

students do not have equal access to the technology-enhanced learning even though they

may have access to the physical classroom (Brown & Brown, 2006). In addition to

thwarting inclusion, using inaccessible technologies opens LEAs up to legal claims of

disability discrimination.

Vulnerability to legal claims of disability discrimination. LEAs that use

inaccessible technology are vulnerable to legal claims of disability discrimination under

the ADA and the Rehabilitation Act of 1973, whether or not the LEAs currently serve

disabled students. To explain this vulnerability, in this subsection I first provide an overview of the aforementioned federal laws and their relevance to technology accessibility. Second, I address litigation and administrative proceedings that LEAs have, in recent years, been forced to defend. Third, I describe a recent decision of the U.S. Supreme Court that clarifies the circumstances under which disabled students can bypass the burdensome administrative procedures of the IDEA and instead directly file discrimination complaints against their LEA under the ADA and the Rehabilitation Act of 1973.

Overview of federal laws. Though K-12 educators are generally familiar with the ADA and the Rehabilitation Act of 1973, they may not realize that these laws are relevant to technology accessibility. When thinking about technology and disabled students, the law that is more likely to come to educators' minds is the IDEA. But, as will be explained later in this section, the IDEA is less relevant to technology accessibility. Before outlining the applicability of the ADA and the Rehabilitation Act of 1973 to technology accessibility, I offer a primer on both of them. The ADA requires that disabled people have equal access to the programs, services, and activities offered by state and local governments (Title II, 42 U.S.C. § 12132) as well as by places of public accommodation (Title III, 42 U.S.C. § 12182). Public K-12 schools are thus covered under Title II of the ADA, as they are a subdivision of state and local governments.

The Rehabilitation Act of 1973 contains two sections that are pertinent to technology accessibility: Sections 504 and 508. Section 504 prohibits the federal government, and entities that receive federal funding, from denying disabled people the right to participate in or benefit from any activity or program and from discriminating

against them based solely on their disability (29 U.S.C. § 794). The Rehabilitation Act of 1973 and, consequently, Section 504 are applicable to K-12 schools because they receive federal funding. Section 508 pertains to the development, maintenance, procurement, and use of information technologies by the federal government, requiring that all of the technology be accessible to disabled people. The Section 508 regulations, which were updated in early 2017, provide a technical standard, WCAG, for compliance with the statute (U.S. Access Board, 2017). Section 508, though not directly applicable to K-12 schools (as they are not part of the federal government) is often used as a benchmark for measuring the accessibility of technology and is therefore an important policy with which K-12 educators should be familiar (Shaheen & Lazar, 2018).

To summarize, K-12 schools (a) must ensure that disabled people have equal access to their programs and services, and (b) shall not deny disabled people from participating in or benefiting from any of their activities or programs, or discriminate against them based solely on their disability. As discussed previously in this chapter, the use of inaccessible technology erects barriers for disabled people, inhibits learning, and often excludes disabled people from participating in activities. Consequently, disability rights attorneys and advocates have argued that K-12 schools that use inaccessible technology discriminate against disabled people and violate the ADA and the Rehabilitation Act of 1973 because (a) they are not providing disabled people equal access to their programs and services and (b) they are denying disabled people from participating in and benefiting from those programs (*Bartleson v. Miami-Dade County School Board*, 2018; Lazar et al., 2015; *Nightingale v. Seattle School District*, 2014).

Therefore, LEAs that use inaccessible technology are vulnerable to legal claims of disability discrimination.

It is worth noting that both of these federal laws protect the rights of disabled people of all ages, unlike the IDEA, which is specific to disabled youth (see 20 U.S.C. § 1400(d)(1)(A)). Consequently, K-12 LEAs have obligations to a larger population of disabled people than they may realize. In addition to students, educational institutions must also provide equal access to disabled parents, disabled employees, and disabled community members. Even in the unlikely event that a LEA does not serve any disabled students, the LEA must still ensure that disabled people have equal access to its programs and services and that disabled people are not denied from participating in or benefiting from those programs (U.S. Department of Education, 2011). Recent litigation and administrative proceedings initiated by parents, employees, and community members demonstrate the vulnerability that LEAs face when using inaccessible technology.

Litigation and administrative proceedings. Over the last several years, thousands of LEAs have learned about the liabilities that result from using inaccessible technology. The following is a description of two lawsuits and a series of administrative complaints that LEAs have recently faced, all of which cite the ADA and the Rehabilitation Act of 1973. The cases are presented in chronological order: _Nightingale v. Seattle School District_ (2014) is presented first, followed by a discussion of a series of Office for Civil Rights (OCR) complaints, and, finally, _Bartleson v. Miami-Dade County School Board_ (2018).

In a 2014 lawsuit filed against Seattle Public Schools (SPS), a blind mother and the National Federation of the Blind alleged that the district discriminated against Ms.

Nightingale because the district's website and a piece of its math software, ST Math, were inaccessible using screen access software, AT that Ms. Nightingale used (*Nightingale v. Seattle School District*, 2014). The plaintiffs alleged that SPS denied Ms. Nightingale the opportunity to participate in her children's schooling in a manner equivalent to that of sighted parents by denying her equal access to data about SPS operations and events and SPS instructional technology (*Nightingale v. Seattle School District*, 2014). For example, the inaccessibility of the ST Math software prevented Ms. Nightingale from tracking her son's progress on math homework and from assisting him with his work. In the end, the lawsuit was settled out of court. The resulting consent decree outlined stringent timelines and steps that SPS had to follow to bring its technology into compliance with accessibility standards and thereby ensure disabled people, like Ms. Nightingale, had equal access to its programs, services, and activities (*Nightingale v. Seattle School District*, 2014).

In the same year the Nightingale case was filed, an advocate in Michigan learned about technology accessibility and began surveying the websites of various K-12 state and local education agencies to see if they were accessible (Samuels, 2016). Determining that most of the K-12 websites she surveyed were inaccessible, the advocate began a five-year campaign in which she filed well over 2,000 complaints with the OCR, which is a division of the U.S. Department of Education (Keierleber, 2018). Consequently, thousands of LEAs have received letters from OCR over the last several years indicating that their websites were inaccessible and as a result they were violating the ADA and the Rehabilitation Act of 1973. The majority of the OCR complaints have resulted in

resolution agreements between the LEA and the OCR, which outlined the steps LEAs needed to take to remediate the accessibility of their websites to comply with federal law.

In April of 2018, Dr. Bartleson, a psychologist employed by Miami-Dade County Public Schools (MDCPS), filed a complaint against MDCPS in U.S. District Court alleging disability discrimination under the ADA and the Rehabilitation Act of 1973. Dr. Bartleson is blind and uses screen access software to access computers and other technologies. According to Dr. Bartleson, MDCPS has developed, procured, and maintained a plethora of inaccessible technologies that inhibit her performance of her job duties (*Bartleson v. Miami-Dade County School Board*, 2018). As a school psychologist, Dr. Bartleson is required to interact with numerous technology interfaces including a student information database, scheduling software, grading applications, assessment websites, and special education management software—all of which, she asserted, are inaccessible using AT (*Bartleson v. Miami-Dade County School Board*, 2018). Furthermore, Dr. Bartleson claimed that MDCPS's use of inaccessible technologies also inhibited her access to employment benefits and career advancement. For example, the LEA's website, where employees sign up for benefits and where job opportunities are posted, was inaccessible using screen access software. As a result, Dr. Bartleson had to seek sighted assistance in order to perform tasks on the LEA's website (*Bartleson v. Miami-Dade County School Board*, 2018). In February 2019, the case came to a close when the court approved a consent decree that required MDCPS to make all of its websites, forms, and web and desktop applications accessible and to ensure that all future technologies that it develops or procures are accessible (*Bartleson v. Miami-Dade County School Board*, 2019).

In sum, since 2014, LEAs around the country have faced allegations of disability discrimination under the ADA and the Rehabilitation Act of 1973 due to their use of inaccessible technologies such as math software, district websites, and administrative applications. A parent, an employee, and community members—not disabled students— brought these allegations. A recent U.S. Supreme Court decision clarifies the rights of disabled students to bring suits against LEAs under the ADA and the Rehabilitation Act of 1973 when their legal claims do not pertain to the denial of a Free and Appropriate Public Education (FAPE; *Fry v. Napoleon Community Schools*, 2017). This decision, which is discussed in the following subsection, has the potential to further expose LEAs to legal claims of disability discrimination when they implement inaccessible technologies, as the decision clarifies that disabled students can seek relief under the ADA and the Rehabilitation Act of 1973 for disability discrimination (*Fry v. Napoleon Community Schools*, 2017).

U.S. Supreme Court decision. In *Fry v. Napoleon Community Schools*, the parents of a child with cerebral palsy brought a suit against the LEA, under the ADA and the Rehabilitation Act of 1973, for discriminating against their daughter by prohibiting her from bringing her service animal to school (2017). The lower courts dismissed the case, citing the parents' failure to exhaust the administrative procedures under the IDEA, as required by Section 1415(*l*). The parents then appealed the case to the U.S. Supreme Court. The subsequent decision issued by the U.S. Supreme Court clarifies how disabled students can employ the three federal statutes that protect their rights—the IDEA, the ADA, and the Rehabilitation Act of 1973. In the decision, Justice Kagan explained that students and their families must only exhaust the IDEA's administrative procedures,

pursuant to Section 1415(*l*), if their allegations pertain to the denial of a FAPE (*Fry v.*

Napoleon Community Schools, 2017). If, however, the allegations do not pertain to a

denial of FAPE, but instead pertain to disability discrimination, the IDEA is not relevant

and therefore students and families need not exhaust the IDEA's administrative

procedures before filing suit. In other words, the fact that a case involves a disabled

student and a school setting does not automatically mean that the IDEA is the controlling

law.

In the decision, Justice Kagan admitted that it could be difficult to determine

whether or not a disabled student's allegation pertains to a denial of a FAPE and,

therefore, whether the student has the standing to file suit under the ADA and the

Rehabilitation Act of 1973 without exhausting the administrative procedures required by

the IDEA. To assist courts with determining whether or not a student's allegations pertain

to a FAPE, Justice Kagan suggested that the following two hypothetical questions be

posed: "First, could the plaintiff have brought essentially the same claim if the alleged

conduct had occurred at a public facility that was not a school? Second, could an adult at

the school have pressed essentially the same grievance?" (*Fry v. Napoleon Community*

Schools, 2017, p. 756*)*. If the answer to both hypothetical questions is "yes," Justice

Kagan argued the complaint is unlikely to be about a denial of a FAPE. Applying Justice

Kagan's two-question test to the *Fry* case, we can conclude that the child could bring a

disability discrimination claim against a public library (or other public non-school

setting) for denying entry to her service dog, and a disabled adult could bring a similar

claim against the school for denying entry to their service dog. Therefore, this case likely

does not pertain to a FAPE and the IDEA. In the end, the *Fry* case was remanded to the

Court of Appeals for a thorough assessment of whether or not the case pertained to a denial of a FAPE (*Fry v. Napoleon Community Schools*, 2017, p. 758–759).

When posing Justice Kagan's questions to an instance of inaccessible technology, it becomes clear that the answer to both hypothetical questions is likely to be "yes." A disabled child could file a claim of discrimination against a public entity other than a school, such as a public library, for using inaccessible technology. Furthermore, as evidenced by the *Nightingale* and *Bartleson* cases, a disabled adult could file a case alleging disability discrimination against a school for using inaccessible technology. Therefore, disabled students could seek relief for disability discrimination under the ADA and the Rehabilitation Act of 1973 if their LEA is using inaccessible technologies. Because the Court's decision now allows students to bring legal actions for disability discrimination under broader disability rights laws (i.e., the ADA and the Rehabilitation Act of 1973) when the provision of a FAPE is not at issue, one could argue that it will be easier for such claims to be brought against LEAs that use inaccessible technology.

Using inaccessible technology exposes LEAs to legal claims of disability discrimination under the ADA and the Rehabilitation Act of 1973; these legal claims could be brought by students, parents, employees, or community members. Therefore, addressing technology accessibility is a prudent course of action for LEAs, as doing so decreases their liability and allows LEAs to make more judicious use of their resources, a topic taken up in the following subsection.

Depletes LEA resources. In addition to exposing LEAs to legal claims of disability discrimination and hampering inclusion efforts, the use of inaccessible technologies depletes LEA resources—specifically, time, money, and public perception—

in two key ways. First, legal claims, whether initiated in the form of legal actions or administrative proceedings, require an LEA to expend a great deal of time and money, and diminish the community's perception of the LEA. For example, MDCPS had to pay Dr. Bartleson and her attorneys $250,000 in monetary relief and attorneys' fees (*Bartleson v. Miami-Dade County School Board*, 2019).

Second, inaccessible technology forces an LEA to spend time and money retrofitting both technology and instruction so that it is accessible (Hashey & Stahl, 2014; Wisdom et al., 2007). For example, when a LEA determines its website is inaccessible and decides to bring the website into compliance with the law, the LEA has to spend significantly more money to retrofit its website for accessibility than it would have if it had created an accessible website from the start (Hashey & Stahl, 2014; Lazar et al., 2015; Wisdom et al., 2007). On the instructional side, if the fifth-grade math curriculum at an LEA is entirely built around the use of an inaccessible math software like ST Math, what do the educators do when a handful of disabled students, who require both assistive and accessible technology, enter fifth grade? The disabled students cannot use the math software at all, but the software is required for every lesson. The LEA purchased the software from a vendor, so the LEA cannot retrofit the software to make it accessible, even if it possesses the technical skills and knowledge to do so. Perhaps the LEA purchases an entirely different math curriculum for the disabled students and the teachers teach two entirely different lessons? Conversely, maybe the LEA decides the teachers will reproduce the content from the software as static handouts for the disabled students, copying and pasting all of the equations and explanations from the software into a word processor.

Whatever the solution, it will require a great deal of time and money to retrofit the fifth-grade math instruction so the disabled students can participate in any meaningful way. Where does that time come from? Unless the LEA begins the retrofitting work over the summer, chances are good that the accessibility work-around will not be in place by the first day of classes (Lazar et al., 2015). So the disabled students give up instructional time in order for the LEA to complete the retrofit work. What of the educators' time? How is the retrofit work integrated into their schedule? Do they forgo the planning time they need to prepare for class? By addressing technology accessibility during the development and procurement process, LEAs avoid the costly effects of retrofitting technology and instruction.

Summary

The literature reveals that addressing technology accessibility is a prudent course of action because inaccessible technology (a) thwarts inclusion, (b) exposes LEAs to legal claims of disability discrimination, and (c) depletes LEA resources—time, money, and public perception. In the last several years, thousands of LEAs learned firsthand about the costly consequences of using inaccessible technologies when they received OCR complaints and lawsuits alleging disability discrimination, which were filed by disabled adults. Now, the *Fry* decision appears to have opened the door for disabled students, who experience disability discrimination because their LEAs' instructional technologies are inaccessible, to also file suit against their LEAs under the ADA and the Rehabilitation Act of 1973. Consequently, LEAs should judiciously use their limited resources to procure technology that is inherently accessible, thereby decreasing their legal exposure and the unnecessary expense of retrofitting. By addressing technology

accessibility during the development and procurement of technology, LEAs ensure that (a) all of their stakeholders will have equal access to their technology-enhanced learning environments, and (b) they protect the LEA resources of time, money, and public perception.

This section outlined the first component of the overarching argument of this chapter—technology accessibility is a 21st-century equity imperative that K-12 LEAs should address. To do so, I first argued that technology accessibility is a 21st-century equity imperative because (a) inaccessible technology denies disabled students full and equal access to education, and (b) technology is becoming an increasingly integral part of K12 education. Then I asserted that addressing technology accessibility is a prudent course of action for LEAs because there are significant consequences to using inaccessible technology. The following section discusses the discourse and practice surrounding K-12 technology accessibility.

K-12 Technology Accessibility Discourse and Practice

The previous section established why technology accessibility is a significant issue in K-12 education. In this section, I examine the available literature to discern the nature of technology accessibility discourse and practice in K-12. Given the significance of the issue, how is it being addressed in K-12 LEAs? Who is involved in these efforts, and what has been the outcome thus far?

My review found that technology accessibility is not yet an integral part of K-12 discourse and practice. In other words, in the majority of LEAs in the United States, technology accessibility is not being addressed. This section also reviews four cases where a combination of conditions created an environment in which technology

accessibility was in fact addressed in K-12. Integrating the evidence from the literature, I conclude that the existence of legal requirements does not automatically translate into accessible technology in K-12 schools; rather, LEAs must engage in the complex process of policy enactment in order to address technology accessibility.

Not Integrated into K-12 Discourse and Practice

Much of the literature that addresses technology accessibility in K-12 education provides evidence that, when viewed in the aggregate, gives rise to the conclusion that technology accessibility is not yet an integral part of K-12 education discourse and practice (Shaheen & Lazar, 2018). Though the corpus of literature addressing technology accessibility in K-12 is small, a few articles point to a lack of awareness and insufficient knowledge as two reasons technology accessibility has not yet been integrated into K-12 discourse and practice.

Evidence that technology accessibility is infrequently addressed. The disability rights laws, which contribute to the requirement that K-12 LEAs use accessible technologies, have been on the books for decades. However, technology accessibility is often not addressed by LEAs, as evidenced by (a) the plethora of inaccessible technology used in K-12 education and (b) the need for the federal government to issue significant policy guidance to remind educational institutions of the legal requirements to use accessible technology. The literature—as well as repeated objections and concerns voiced by disability rights advocates, some of which were discussed earlier in this chapter— illuminate the prevalence of inaccessible technology in K-12, including web content and applications, assessments, and ebooks (Kamei-Hannan, 2008; National Federation of the Blind, 2015; Riccobono et al., 2015; Riccobono & Rosenblum, 2016; Shaheen & Lohnes

Watulak, 2019). The inaccessibility of K-12 web-based technologies has received, by far, the most attention in both the literature and the grievances of disability rights advocates.

Six studies conducted between 2003 and 2009 investigated the accessibility of a wide variety of K-12 websites, from school websites to state department of education websites, and found significant accessibility barriers (Bray et al., 2007; Bray, Flowers, & Gibson, 2003; Bray, Flowers, Smith, & Algozzine, 2003; Krach & Jelenic, 2009; Opitz, Savenye, & Rowland, 2003; Wells & Barron, 2006). For example, in 2003, Bray, Flowers, and Gibson found that 74.3% of 567 district websites contained accessibility barriers, and in 2009 Krach and Jelenic found that 86.14% of 534 district websites were inaccessible. The thousands of OCR complaints filed between 2014 and 2018 against LEAs for having inaccessible websites indicate that inaccessible websites persist in K-12 (Keierleber, 2018).

Websites are not the only problematic web-based technologies in K-12; web applications also pose accessibility barriers. ST Math, a web-based elementary mathematics software, was specifically cited in *Nightingale v. Seattle School District* as posing accessibility barriers to disabled people who use screen access software (2014). Furthermore, the accessibility barriers posed by Google Applications for Education were enumerated by disability rights advocates in a formal response to a Supplemental Advanced Notice of Proposed Rulemaking, which was issued by the U.S. Department of Justice in regard to revising Title II of the ADA (Riccobono & Rosenblum, 2016).

The inaccessible technology that exists in K-12 is not limited to the Internet. Standardized assessments and ebooks have also been found to be inaccessible to disabled people. A study of the accessibility of a computer-adapted test found that disabled

students could not answer 20.55% of 42 test questions (Kamei-Hannan, 2008). More recently, disability rights advocates expressed concern about the inaccessibility of the Common Core State Standard–aligned test that was being used by the Smarter Balanced Assessment Consortium (Riccobono et al., 2015).

Ebooks were originally developed by disabled people to facilitate access to inaccessible print material, so the original ebooks were inherently accessible (Lazar et al., 2015). However, as ebooks have become a mainstream phenomenon, the philosophy of accessibility has frequently been lost in translation. For example, a study of three e-reader platforms found that two of the three platforms did not offer any accessibility features and as a result could not be used by disabled students (Maatta & Bonnici, 2014). The Kindle platform and hardware have a long history of inaccessibility, which dates back to the birth of the platform (Lazar et al., 2015). In 2015, in response to a planned $30 million contract between New York City Public Schools and Amazon to implement Kindle ebooks across the LEA, disability rights advocates initiated a media campaign and planned a public demonstration to get the attention of school district officials, who had ignored previous requests for a meeting to discuss the inaccessibility of the technology they were planning to adopt (National Federation of the Blind, 2015).

Five years before the LEA in New York City considered adopting the Kindle platform, the U.S. Departments of Education and Justice jointly issued a Dear Colleague Letter to all K-12 and higher-education institutions that highlighted that the use of Kindles and other inaccessible technologies was a discriminatory practice that violated federal law (Perez & Ali, 2010). The Dear Colleague Letter, which is considered a form of significant policy guidance, was issued as a direct result of the numerous complaints

that the Department of Education had received from disabled students who were confronting barriers in school due to the use of the Kindle platform. A year later, after receiving questions from educational institutions, the Department of Education issued a follow-up frequently asked questions document that clarified that (a) educational institutions that do not serve any disabled students are still required to use accessible technology, and (b) the accessibility requirements apply to all technology used by educational institutions in the U.S (2011).

Despite longstanding legal requirements for accessible technology in education, technology accessibility is often not addressed in K-12. Inaccessible technologies abound in the form of websites, web applications, standardized assessments, and ebooks. Why is technology accessibility so often not addressed in K-12? The literature provides a few hints.

Hurdles to K-12 technology accessibility discourse and practice. The literature indicates that K-12 educators' general lack of awareness about technology accessibility as well as their limited understanding of the construct are two major hurdles to addressing technology accessibility within LEAs (Hendricks et al., 2003; Noble, 2005; Wisdom et al., 2007). The third hurdle, a general misconception about who should be responsible for technology accessibility, is the result of the limited understanding of technology accessibility that exists in many LEAs (Noble, 2005; Wisdom et al., 2007).

Noble (2005) conducted a survey of all of the LEAs in Kentucky about technology accessibility. Noble found that 23.4% of participants had never heard of the federal laws related to accessibility and only 30.3% of participants had heard of Kentucky's technology accessibility law. Noble also found that the majority of

participants (67.5%) had never heard of the automated accessibility checker tools, such as Bobby, that were popular at the time. This finding indicates that though participants may have heard of federal laws related to technology accessibility, they were likely not doing much technology accessibility work; if they had been doing such work, they would have been familiar with tools like Bobby.

Similar findings were reported in a qualitative study conducted in the Northwest a few years after Noble's work. In interviews with 36 K-12 stakeholders (e.g., K-12 educators and technical assistance center staff), Wisdom and colleagues (2007) found that the majority of participants were familiar with special education law (i.e., IDEA), but were unfamiliar with laws related to technology accessibility. Several participants in the study indicated that they did not learn about these laws until specific issues or complaints arose (Wisdom et al., 2007). If K-12 stakeholders outside of the Northwest are also waiting until issues arise to learn about the relevant laws that could explain why awareness about technology accessibility and the associated laws remains low in K-12.

A basic awareness of accessibility and the related laws is helpful, but awareness alone is insufficient to address technology accessibility. According to Hendricks and colleagues (2003), K-12 educators in Maryland often lacked the requisite knowledge to scrutinize instructional technologies for adherence to accessibility standards. Back in Kentucky, Noble (2005) observed that K-12 stakeholders who possessed awareness about technology accessibility often lacked sufficient understanding to distinguish between the related but distinct constructs of AT and technology accessibility. The confusion between AT and technology accessibility leads to a misconception about who should be responsible for ensuring an LEA's technology is accessible.

Noble (2005) asserted that K-12 stakeholders often view technology accessibility as a special education problem. Since the special education department is generally not in charge of procuring instructional technology, and may not even be involved in conversations around procurement, there is little this department can do on its own to address technology accessibility at the crucial stage of procurement. Conversely, the technology department may not have enough of an understanding of the needs of disabled users to feel comfortable addressing technology accessibility (Shaheen & Lohnes Watulak, 2019). Collaboration between technology departments and disability experts is an ideal way to address technology accessibility during the development and procurement phases (Lazar et al., 2015). Unfortunately, in K-12 there is often a lack of communication and collaboration between the special education and technology departments (Wisdom et al., 2007).

The laws that protect the rights of disabled people and contribute to the requirement that K-12 LEAs use accessible technologies are decades old, yet technology accessibility is often not addressed in K-12 education. Clearly, the existence of these laws has not automatically translated into the use of accessible technologies in K-12. A lack of basic awareness about technology accessibility—as well as a deeper understanding of the construct—contributes to the elusiveness of technology accessibility in K-12. After all, LEAs cannot address technology accessibility and thus comply with the law if they are unaware of the construct as well as the implications of the laws. In order to address technology accessibility, LEAs must engage in the complex process of policy enactment, wherein they learn about and interpret the laws, their implications, and the associated constructs, and then translate that knowledge into local practice.

At the turn of the century, technology accessibility policy was enacted in K-12 in four states where a confluence of conditions supported the work. The four cases and the conditions that facilitated the work are discussed in the following section.

Exemplar State-Level Initiatives

Though much of the literature paints a somewhat bleak picture of technology accessibility in K-12, a few bright spots are apparent if one looks back far enough. In the early 2000s, four states—Kentucky, New Mexico, Maryland, and South Carolina—had dedicated initiatives to increase the enactment of technology accessibility policy in K-12 (Hendricks et al., 2003; Kaplan et al., 2006; Noble, 2005; Peterson, 2005). As a result of those initiatives, some LEAs in those states began to address technology accessibility, though it is unclear from the literature if those LEAs continue to address technology accessibility today. All four state-level initiatives created three conditions that supported LEAs' enactment of technology accessibility: (a) a heightened attention to state and federal policies pertaining to technology accessibility, (b) a stakeholder support team with knowledge of accessibility to bolster the LEAs' work, and (c) a selection of professional learning opportunities about technology accessibility that educators could attend to increase their knowledge and skills. Before discussing these three key conditions in more detail, I will offer a brief overview of the four state initiatives.

State initiatives. In 2000, Kentucky passed the Accessible Information Technology law (Ky. Rev. Stat. Ann. § 61.980 et seq.), a state-level technology accessibility statute that explicitly required K-12 schools to adopt and implement accessible technology (Lazar et al., 2015; Noble, 2005). Though many states passed accessible information technology laws in the early 2000s, Kentucky's statute was one of

two that explicitly pertained to K-12 schools (Golden & Buck, 2003; Shaheen & Lazar, 2018). Despite the law's explicit reference to K-12 education, anecdotal evidence available to K-12 technology accessibility advocates indicated that Kentucky LEAs were not addressing technology accessibility (Noble, 2005). To help school districts understand and apply the new Kentucky law, the Accessible Information Technology in Schools (AITIS) project was jointly launched by the Kentucky Assistive Technology Service Network and the Kentucky Department of Education's Division of Exceptional Children Services (Noble, 2005). This federally funded project created resources and tools (e.g., example procurement and policy language) and provided professional development to assist school districts (Noble, 2005). As a result of this work, five LEAs across the state developed technology accessibility initiatives (Noble, 2005).

Like Kentucky, New Mexico, too, had a K-12 technology accessibility initiative—the Accessible Electronic and Information Technology in Education project. This federally funded project worked to increase the adoption of technology accessibility using a two-pronged approach that consisted of both top-down and bottom-up mechanisms (Peterson, 2005). The initiative developed legislation and compliance policies related to technology accessibility, the central component of the top-down mechanism, which helped to guide school districts. The bottom-up mechanism comprised LEA-level demonstration projects as well as professional development and outreach. Peterson (2005) reported that superintendents of districts that participated in the demonstration project felt strongly that the enactment of district technology accessibility policies and the implementation of professional development would sustain an ongoing focus on technology accessibility at the LEA level.

The Maryland State Board of Education passed regulations (Code of Maryland Regulations [COMAR] 13A.05.02.13H) in 2001 requiring that technology accessibility, specifically Section 508 compliance, be a component of instructional technology procurement processes, and that teacher-created materials be accessible by the year 2004 (Hendricks et al., 2003). As in Kentucky, even after the passage of the state technology accessibility policy pertaining to K-12 education, few Maryland LEAs enacted the policy. To support school districts' enactment of technology accessibility, the Maryland State Board of Education collaborated with the Mid-Atlantic Regional Technology in Education Consortium to develop resources and training for educators. Supports that were made available included an accessibility checklist to facilitate instructional technology accessibility evaluations, online tutorials about technology accessibility and the language of Section 508, and a database to house instructional technology accessibility evaluations conducted by educators, which facilitated the sharing of information between LEAs.

To encourage the enactment of technology accessibility in K-12 education in South Carolina, the state department of education collaborated with the Southeast Initiatives Regional Technology in Education Consortium and the South Carolina Assistive Technology Project to develop a five-year state education technology plan that emphasized technology accessibility, as well as a CD-ROM of training materials on technology accessibility (Kaplan et al., 2006). The education technology plan, *South Carolina State Technology Plan 2003–08: Realizing the Dream*, included guidance for LEAs to develop their own education technology plans that highlighted the incorporation

of technology accessibility. The training CD-ROM featured video clips of students and teachers using accessible technology in the classroom.

Supportive conditions. All four state-level initiatives created conditions that supported LEAs to enact technology accessibility policy. The four initiatives had three key supportive conditions in common: (a) They elevated the prominence of state and federal policies pertaining to technology accessibility, (b) they provided support teams of experts in technology accessibility and K-12 education to bolster the LEAs' work, and (c) they offered a selection of professional learning opportunities about technology accessibility that educators could attend to increase their knowledge and skills. A discussion of each of the three supportive conditions follows.

At the turn of the century, state governments across the country were paying more attention to technology accessibility as a consequence of the recent promulgation of the Section 508 regulations (Golden & Buck, 2003). Many states, including the four that are discussed herein, passed state-level policies requiring the use of accessible technology in state government (Shaheen & Lazar, 2018). The enactment of the state-level policies drew additional attention to the topic of technology accessibility. However, the new federal and state policies were insufficient to draw the notice of LEAs. Consequently, the four state departments of education created technology accessibility initiatives, which served to increase the prominence of the topic and the related policies (Hendricks et al., 2003; Kaplan et al., 2006; Noble, 2005; Peterson, 2005). With this increased prominence, technology accessibility garnered the attention of local LEAs. Elevating the prominence of technology accessibility and the related policies in state-level K-12 conversations was the first key condition for LEAs to enact technology accessibility.

In addition to drawing LEAs' attention towards technology accessibility, the four state departments of education created teams of K-12 stakeholders to develop and facilitate their initiatives. In each state, these teams included both staff from the state department of education and professionals with expertise in technology accessibility. By integrating their collective knowledge of K-12 and technology accessibility, these stakeholder teams were able to support the LEAs by providing resources such as model LEA policy language, technology accessibility checklists, databases of crowdsourced technology accessibility evaluations of instructional technologies, and sample procurement language (Hendricks et al., 2003; Noble, 2005; Peterson, 2005). Additionally, these stakeholder teams served as sounding boards and starting places for questions. The stakeholder support teams, and the resources that they provided, were the second key condition that supported LEAs' enactment of technology accessibility.

Finally, all four states' initiatives included professional learning opportunities focused on technology accessibility. For example, Maryland offered online tutorials for its LEAs, and Kentucky and New Mexico offered face-to-face professional development workshops (Hendricks et al., 2003; Noble, 2005; Peterson, 2005). These professional learning opportunities helped to address the limited understanding of technology accessibility among educators that inhibits the work in K-12 (Noble, 2005; Wisdom et al., 2007). Consequently, the professional learning opportunities were the third key condition that supported LEAs' enactment of technology accessibility.

This section examined the literature about K-12 technology accessibility knowledge and practice. The evidence indicates that technology accessibility is often not addressed in K-12 due to educators' general lack of awareness and limited understanding

of the construct. In the few cases where LEAs have addressed technology accessibility, they have done so in the presence of conditions that support the process of policy enactment. Thus, for LEAs to address technology accessibility, they must engage in the complex process of policy enactment, which may only be possible under certain supportive conditions.

Advancing K-12 Technology Accessibility

This chapter has argued that technology accessibility is a 21st-century equity imperative that is not being addressed in the majority of K-12 LEAs in the U.S. In order for LEAs to address this equity imperative, they must engage in the policy enactment process. The literature provides insight into the state of technology accessibility practice in the early 2000s, suggesting that the mere existence of laws did not translate into LEAs addressing technology accessibility. In order for LEAs to begin addressing technology accessibility, conditions that supported LEAs' enactment of technology accessibility policy also had to exist.

However, the literature provides little insight into what is occurring today. Are any LEAs currently enacting technology accessibility policy? If so, what conditions are supporting their enactment process? This section argues that though the literature offers some information about technology accessibility work that occurred in the early 2000s, the literature does not provide any insight into the enactment of technology accessibility policy in the current K-12 education context. Therefore, additional research is needed so that stakeholders can make research-informed decisions about enacting technology accessibility policy. This section first identifies gaps in the literature and next argues that

the present study is well suited as a starting point to bolster the limited K-12 technology

accessibility knowledge base.

Gaps in the Literature

Across the broad literature reviewed in this chapter, three specific gaps are

apparent. First, there is no empirical research that provides details about the work of

LEAs to address technology accessibility at any time in history. The available literature

indicates that some technology accessibility work took place in K-12 in the early 2000s

(Hendricks et al., 2003; Kaplan et al., 2006; Noble, 2005; Peterson, 2005). However, that

literature is limited in several ways: It is not empirical; it focuses more on the work of the

state education agency than on the work within the LEAs; and unsurprisingly, given the

lack of empirical rigor, it lacks a theory that explicates the enactment of technology

accessibility across LEAs. Second, there is no data in the literature about how federal and

state policies related to technology accessibility are translated into practice in K-12.

Much of the literature discusses the legal authority for technology accessibility in K-12 to

remind educators of their responsibilities, but the information is offered as a statement of

fact, not as the result of research. One empirical study in the corpus examined K-12

technology accessibility policy (i.e., Shaheen & Lazar, 2018), but it focused solely on the

contents of the policies—not what K-12 stakeholders do with those policies. Third, given

the age of the sample, the literature offers no information about what (if any) technology

accessibility work is occurring in K-12 today.

The K-12 technology accessibility knowledge base is currently quite limited, as

evidenced by the aforementioned gaps. Consequently, a great deal of additional research

is needed to better understand K-12 technology accessibility discourse and practice.

Taking into consideration the weaknesses in and characteristics of the literature, I conducted a CGT study, using policy enactment as the theoretical framework, to investigate the process by which K-12 LEAs enact technology accessibility policy. I chose this approach to the topic for several reasons. First, given that technology accessibility is best addressed at the system level (Lazar et al., 2015; Wisdom et al., 2007) and there is no empirical research examining the current work of LEAs to address technology accessibility, it is logical to begin a new research agenda by examining the work of LEAs that are addressing technology accessibility today. Second, since the literature indicates that the existence of policy does not automatically translate into accessible technology in K-12 schools, it is advantageous to qualitatively investigate LEA policy work through the lens of policy enactment, which facilitates capturing the complex and messy process of translating policy into local practice. Third, given that the knowledge base lacks a theory about the process of K-12 technology accessibility policy enactment, research that can produce a theory to explicate this process would make a significant contribution, providing K-12 stakeholders with some of the information they need to make research-informed decisions about addressing technology accessibility in their LEA.

Chapter II Summary

This chapter has reviewed a broad corpus of literature to construct an understanding of current discourse and practice surrounding K-12 technology accessibility. Synthesizing the available evidence, I argued that (a) technology accessibility is a 21st-century equity imperative that K-12 LEAs should address, and (b) to do so LEAs must engage in the complex process of technology accessibility policy

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enactment, but (c) the literature does not provide any insight into the enactment of

technology accessibility policy in the current K-12 education context. Therefore,

additional research is needed to support stakeholders in making research-informed

decisions about enacting technology accessibility policy. The chapter also examined the

weaknesses and characteristics of the current knowledge base and determined that a CGT

study of the process by which K-12 LEAs enact technology accessibility policy would

make a significant contribution to the field, given the sizable gaps in the literature. The

next chapter describes the methodology of the qualitative study that emerged from the

literature review.

CHAPTER III

METHODOLOGY

The previous chapter argued that technology accessibility is a 21st-century equity

imperative that K-12 LEAs should address, and identified three key gaps in the literature:

(a) There is no empirical research that provides detail about the work of LEAs to address

technology accessibility at any time in history; (b) there is no data about how federal and

state policies related to technology accessibility are translated into practice in K-12; and

(c) there is no information about what (if any) technology accessibility work is occurring

in K-12 today. The aim of this chapter is to describe, in detail, the CGT methodology that

was used to guide this study, which was designed to address the three aforementioned

gaps in the literature by constructing a theory about how K-12 LEAs are enacting

technology accessibility policy in the current educational context. The chapter begins

with an overview of the family of grounded theory approaches, contrasting CGT with its

methodological cousins and providing rationale for why CGT was the approach used in

this study. The remainder of the chapter is devoted to the specifics of how the study was

conducted and includes sections such as setting and participants, data collection, data

analysis, credibility, and limitations.

Research Design and Rationale

Answering the proposed study's research questions required a qualitative

approach, specifically grounded theory. In well-designed research, the research question

begets the research design (Punch & Oancea, 2014). In this study, the research questions

sought to understand a process and the experiences of organizations engaged in that

process, which begat a qualitative research design (Creswell, 1994; Merriam, 2009). The

interpretivist worldview from which qualitative research operates conceptualizes reality as multiple (i.e., two people likely experience the same event differently), and knowledge as constructed via interactions with other people in specific cultural and historical contexts (Merriam, 2009). Therefore, qualitative research is particularly well suited to investigations of how humans experience the world and how they subsequently interpret and make meaning of those experiences (Merriam, 2009).

Furthermore, the study's research questions dictated which of the qualitative approaches to employ. Among the family of qualitative approaches, grounded theory is best suited for understanding processes (Creswell, 2013). Furthermore, grounded theory is the only qualitative approach appropriate for moving beyond description to construct a substantive theory; as Creswell explained, "[g]rounded theory is a good design to use when a theory is not available to explain or understand a process" (2013, p. 88). As discussed in chapter 2, a theory about the process of K-12 LEA technology accessibility policy enactment does not exist in the literature. Consequently, grounded theory was the ideal methodology for this investigation.

Grounded theory is a family of approaches that share a common lineage and a common end goal, a substantive theory, but differ in methodological detail because they arise from different worldviews. The following subsection briefly describes the family of grounded theory methodologies and their associated worldviews. The final subsection provides a more detailed explanation of CGT followed by an explanation of why this version of grounded theory was best suited for the investigation discussed herein.

Grounded Theory

Grounded theory was first developed by Barney Glaser and Anselm Strauss in 1967 to remedy what they saw as a mismatch between the a priori theories in sociology and the people and contexts that the researchers were studying at the time (1967). To develop more appropriate theories, Glaser and Strauss (1967) insisted that theories—what they termed substantive theories—should be grounded in and result from data from the field, a novel idea at a time when other researchers viewed theories exclusively as ideas that one found in the literature and then explored through research. The substantive theories that Glaser and Strauss (1967) advocated pertained to discrete areas of work (Merriam, 2009), and therefore were not as broadly applicable as formal theory. However, Glaser and Strauss (1967) argued, substantive theory could act as a jumping-off point for the development of formal theory. Glaser and Strauss's original grounded theory emerged during a period where the academy's focus was almost exclusively on quantitative methodologies, a reality that their work would help to change (Charmaz, 2014; Merriam, 2009).

Glaser and Strauss, hailing from different schools of thought, mixed two arguably contradictory sociological traditions—positivism and pragmatism—to develop grounded theory. Glaser was trained in quantitative methodologies at Columbia University and brought to grounded theory a positivist worldview, rigorous systematic methods, and the idea of generating middle-range theories (Charmaz, 2014; Merton, 1957). Conversely, Strauss was trained in field research within the Chicago school of pragmatism and brought to grounded theory the "… notions of human agency, emergent processes, social

and subjective meanings, problem-solving practices, and the open-ended study of action"
(Charmaz, 2014, p. 9).

To legitimize and demystify qualitative research in the eyes of their colleagues in
the academy, who were very focused on quantitative methodologies, Glaser and Strauss
sought to "codify qualitative research methods… [which] entailed specifying explicit
strategies for conducting research" (Charmaz, 2014, p. 9). The resulting methodology
approached research primarily from a positivist worldview, which Glaser brought to the
collaboration; consequently, in the initial version of grounded theory, the researcher was
viewed as an objective observer, reality was viewed as singular and external, and fairly
rigid methods for data analysis were employed (Charmaz, 2014; Creswell, 2013;
Merriam, 2009). Glaser and Strauss' initial work on grounded theory in the 1960s
contributed much of the initial momentum that resulted in an increased use of qualitative
methodologies through the end of the 20th century (Charmaz, 2014; Merriam, 2009).

Key components of the initial version of grounded theory included simultaneous
data collection and analysis, the acceptance of both quantitative and qualitative forms of
data (where applicable), generating analytical categories from data rather than from
existing theories, employing the constant comparative technique to facilitate comparisons
during all stages of analysis, the goal of moving theory development forward at each
stage of the research process, and the use of memo writing to facilitate theory
development (Charmaz, 2014; Glaser & Strauss, 1967). These key characteristics,
originally outlined by Glaser and Strauss, remain visible in grounded theory studies
today; however, what was once a single methodological approach has, over time, become

a family of approaches that share some of the key components but differ in many other ways.

Glaser and Strauss eventually took grounded theory in different directions, setting up one of the more visible and contentious debates in the field of qualitative research. Strauss advocated for a more flexible and less prescriptive methodology, pulling grounded theory back towards his pragmatist roots. In contrast, Glaser remained steadfast in his original conceptions of grounded theory and berated Strauss and his new co-author, Corbin, for belying the core tenets of grounded theory (Charmaz, 2014; Glaser, 1992). Later, Clarke (2005) and Charmaz (2014) joined the grounded theory discussion, promoting versions of grounded theory that departed from the positivist worldview of Glaser and Strauss. Clarke (2005) advocated approaching grounded theory from a post-modern worldview, whereas Charmaz (2014) advocated approaching grounded theory from an interpretivist worldview, acknowledging multiple realities and unique local worlds. Charmaz (2014) called her interpretivist version of grounded theory *constructivist grounded theory* (CGT) to emphasize subjectivity and the active role of the researcher in constructing both data and theory. The following section outlines CGT, the methodology that was employed in this study.

Constructivist Grounded Theory

In defining CGT, Charmaz (2014) pushed back against those who attempted to define the methodology solely by its worldview, its unique logic of inquiry, its procedures, or its flexible guidelines. She asserted that one must define the methodology by describing the researcher and the research process, because the grounded theory is the result of the researcher's emerging constructions and the emerging research process.

While CGT builds upon the foundation of earlier versions of grounded theory, incorporating the inductive and open-ended approach of Glaser and Strauss (1967), as well as the iterative rationale and the focus on both meaning and action that Strauss brought from pragmatism, it discards three key components of objectivist grounded theory and replaces them with components that are aligned with the interpretivist worldview from which CGT approaches research (Charmaz, 2014).

First, CGT rejects rigid procedural applications and instead provides a flexible framework to facilitate theory construction. Consequently, Charmaz conjectured that CGT, in contrast to objectivist grounded theory, bolsters research by "guiding interpretive theoretical practice" (2014, p. 233) rather than constraining researchers to a predetermined path. Second, CGT "… shred[s] notions of a neutral observer and value-free expert" (Charmaz, 2014, p. 13) associated with objectivist grounded theory, and instead insists that researchers interrogate how their life experience, beliefs, and values will shape their research. Third, Charmaz (2014) rebuffed the notion that grounded theory researchers discover theory as it emerges from and is given in the data. On the contrary, Charmaz (2014) argued that researchers, who are embedded in the research context and heavily engaged in data collection and analysis, do not discover theory, as such an idea assumes that the researcher is a neutral observer and that truth is singular and external. Rather, she argued, researchers actively construct theory.

But what is theory? Theory is often defined as "a general proposition, or logically connected system of general propositions, which establishes a relationship between two or more variables" (Abend, 2008, p. 177). This view of theory, which is firmly rooted in a positivist worldview, assumes the separation of value and fact, and emphasizes

explanation, prediction, and universality; it aims to test theoretical concepts as variables, predict the relationship between variables, use hypothesis-testing to verify those relationships, and generate hypotheses for further study (Charmaz, 2014). This, however, is not the way that CGT researchers view and define theory. The interpretivist definition of theory that CGT employs is rooted in pragmatism, prioritizes abstract understanding, assumes there are multiple realities, and regards theoretical understanding as arising from "the theorist's interpretations of the studied phenomenon" (Charmaz, 2014, p. 230). According to Charmaz, the aims of interpretivist theory include "understand[ing] meanings and actions and how people construct them" (2014, p. 231), understanding a phenomenon in abstract terms, and acknowledging the subjectivity inherent in theorizing. Theory in CGT moves from specifics to general assertions and situates those assertions firmly in the context in which they were constructed. From that foundation, Charmaz defined substantive theory as "a theoretical interpretation or explanation of a delimited problem in a particular area, such as family relationships, formal organizations, or education" (2014, p. 344).

Based on these ideas, Charmaz (2014) identified six key features of CGT:

1. CGT is a fluid and interactive process of research.

2. Methodological choices about data collection are informed by a research topic.

3. Researchers are not separate from the context that they study; rather, they are a part of the context.

4. CGT analysis may lead the researcher to use multiple data collection methods and to collect data at a handful of sites to facilitate theory construction.

5. The foundation of CGT analysis is the use of comparative analysis to proceed through several stages of abstraction.

6. The way that researchers interpret and interact with their comparisons and the resulting analysis drives the direction of analysis; analysis is not guided by prescriptions or meaning that is inherent in the data, because meaning is constructed through the research process.

In addition to defining CGT, Charmaz (2014) advanced a definition of the term *process*, which describes both the research process and the processes that are the subject of grounded theory inquiry. She explained,

> A process consists of unfolding temporal sequences that may have identifiable markers with clear beginnings and endings and benchmarks in between. The temporal sequences are linked in a process and lead to change. Thus, single events become linked as part of a larger whole. (Charmaz, 2014, p. 17)

Process is central to CGT both in how the methodology emerges within a given study and in the focus of inquiry. Process is also central to the study discussed herein, which constructed a theory about the process of K-12 technology accessibility policy enactment. Therefore, grounded theory was the most appropriate methodology for this research because a process was the subject of inquiry and the study aimed to construct a theory about that process.

Within the grounded theory family of approaches, the CGT approach was the most appropriate choice for this study for three reasons. First, CGT offered a framework and flexible guidelines as opposed to rigid procedures. These features were critical for this investigation given the nuanced and highly contextualized process of policy

enactment, which makes it difficult for researchers to predict what data will need to be collected and how precisely the research process will unfold. Second, CGT positions the researcher as central to the investigation and therefore emphasizes reflexivity, a characteristic that was crucial for the proposed investigation. I have strong beliefs about technology accessibility that, at times, differed from the beliefs of participants and therefore needed to be acknowledged and documented. Third, as has been argued elsewhere (Charmaz, Thornberg, & Keane, 2018), CGT is particularly useful in investigations that involve matters of social justice. Central to this investigation was the topic of technology accessibility, which is a social justice concern because, as I have argued previously, inaccessible technology excludes disabled students. This section outlined the rationale for using CGT in this investigation; the following section outlines the research questions that drove the study.

Research Questions

Researchers using CGT enter the field with research questions that they believe will be appropriate for the research context. However, a researcher may discover in the process of collecting data that the research question with which she entered the field is not the most important question to ask (Charmaz, 2014). CGT, as an emergent methodology, is flexible enough to handle warranted modifications to research questions. With the emergent nature of CGT in mind, I entered the field for the proposed study with initial research questions. Throughout the study, I remained open to what I was learning from the data and to the potential to modify the research questions as needed. However, none of the knowledge that I constructed about the phenomenon necessitated a

modification to the research questions. Consequently, the research questions outlined below guided the study from beginning to end.

To understand the enactment process of K-12 LEAs, three main research questions guided this qualitative CGT study:

1. What is the process by which K-12 LEAs enact technology accessibility policy?

2. How does that process unfold, and why does the process unfold as it does?

3. How do LEAs engaged in the process make meaning of the experience of enacting technology accessibility policy?

Grounded theory studies focus on processes; accordingly, the unit of analysis for grounded theory studies is generally the process of interest (Creswell, 2013). Ergo, the unit of analysis for this study was the process of technology accessibility policy enactment at individual LEAs. As a result, this research involved both the selection of LEAs (i.e., sites), where the unit of analysis was located, and the selection of individuals (i.e., participants) who could share their experiences with the process.

Setting and Participants

This section provides details about the sites and participants involved in the study and how they were selected. In qualitative research, rich descriptions of the settings in which data were collected are important, as such detail provides context for understanding the findings.

Research Sites

The aim of this study was to understand the technology accessibility enactment process at LEAs; therefore, the research sites had to be places where the policy was being enacted. To identify LEAs that had the requisite experience, I used purposeful sampling.

In purposeful sampling, the researcher intentionally selects sites and individuals who have experience with the phenomenon of interest and can provide insight to help answer the research questions (Creswell, 2013; Merriam, 2009). The specific type of purposeful sampling I used to identify LEAs was the snowball sampling method, whereby the researcher identifies a few key informants who are knowledgeable about the phenomenon and can help identify potential participants (Creswell, 2013; Merriam, 2009). In this study, the informants were technology accessibility experts, with whom I had a professional connection, who worked in K-12 or had K-12 expertise (e.g., they consulted with LEAs around the country on accessibility, or they were former K-12 educators). These experts identified LEAs that were enacting technology accessibility policy. Once identified by the experts, the LEAs had to meet the following inclusion criteria: (a) They had to be engaged in the process of enacting technology accessibility during the 2018 calendar year, and (b) they had to be located in one of the 48 contiguous states. From the list of 17 LEAs offered by the experts, five LEAs met the inclusion criteria and were willing to participate in the research. The five participating LEAs identified through purposeful snowball sampling were Broad Ridge Independent School District, Keystone School District, Mount Elison Schools, Milford Point School Corporation, and Mishawaka Area Co-Op. Table 1 provides an overview of the five LEAs and a detailed description of each research site follows. Additionally, in this section, I provide a brief biography of the individuals at each site who were most involved in the LEA's technology accessibility work and who were interviewed during the study.

Table 1

Overview of LEAs

LEA	State	Locale	Total student population	Number of students receiving special education services
Broad Ridge Independent School District	IN	Small city	11,500	1,500
Keystone School District	KY	Small rural town	2,800	300+
Mount Elison Schools	MO	Suburb of a large city	18,000	2,000+
Milford Point School Corporation	MI	Small city	9,000	1,000+
Mishawaka Area Co-Op	MI	Exurban area	36 K-12 schools, 1,200 students	300

Broad Ridge Independent School District. Located in a relatively small Indiana

city with a population of just over 44,000 (U.S. Census Bureau, 2010), this LEA had

approximately 11,500 students, approximately 1,500 of whom received special education

services (U.S. Department of Education, 2018). The 17 schools within the LEA were

situated in a small city. The LEA was led by a cabinet of administrators, which included

the Superintendent, the two Assistant Superintendents, and the Directors of Secondary

Education, Elementary Education, Special Education, Title Services, and Operations.

Broad Ridge had an LEA-wide UDL initiative that it bolstered by running UDL-

focused professional development for its educators several times a year and by employing

teacher leaders across the LEA as UDL facilitators and coaches. The LEA's technology

accessibility work, which the LEA closely linked to its UDL work, was conducted

primarily by the technology department. This department collaborated with the Coordinator of Instructional Technology, Isaac, on some aspects of the work, such as procuring instructional technologies. As illustrated in Figure 2, both the Director of Technology, Tom, and the Coordinator of Instructional Technology, Isaac, reported directly to the Director of Secondary Education, who sat on the cabinet. Broad Ridge was one of the more than 2,400 K-12 institutions to receive an OCR complaint as part of the web accessibility campaign facilitated by an advocate in Michigan, which was discussed in detail in chapter 2. Unlike the vast majority of LEAs that received the complaints, Broad Ridge's complaint did not result in a resolution agreement. Broad Ridge was able to leverage the knowledge of their technology department to respond quickly to the complaint and resolve the accessibility barriers; as a result, the complaint was dismissed and a resolution agreement was not needed between the LEA and the OCR.

At the time of this study, Tom was the Director of Technology; he had a background in computing and information technology and had worked in industry before bringing his technical knowledge to the K-12 sector. Tom and his department were responsible for all technologies across the LEA, such as computers, projection systems, telephones, and all of the software that supports those technologies. In addition to his work on technology accessibility within the LEA, Tom helped to raise technology accessibility awareness and disseminate technology accessibility resources in his capacity as president of a national professional organization for K-12 technology leaders.

Vivian and Laura worked in the technology department under Tom; both had worked for Broad Ridge for over a decade and had technical backgrounds. Vivian was the Coordinator of Operational Systems; she led the team within the department that was

responsible for installing, maintaining, and fixing all of the LEA's hardware (e.g., computers, AV equipment, telecommunication devices). Laura was the Information Systems Leader; she led the team within the department that was responsible for maintaining all of the LEA's information systems (e.g., student data warehouse, websites, finance, food service).
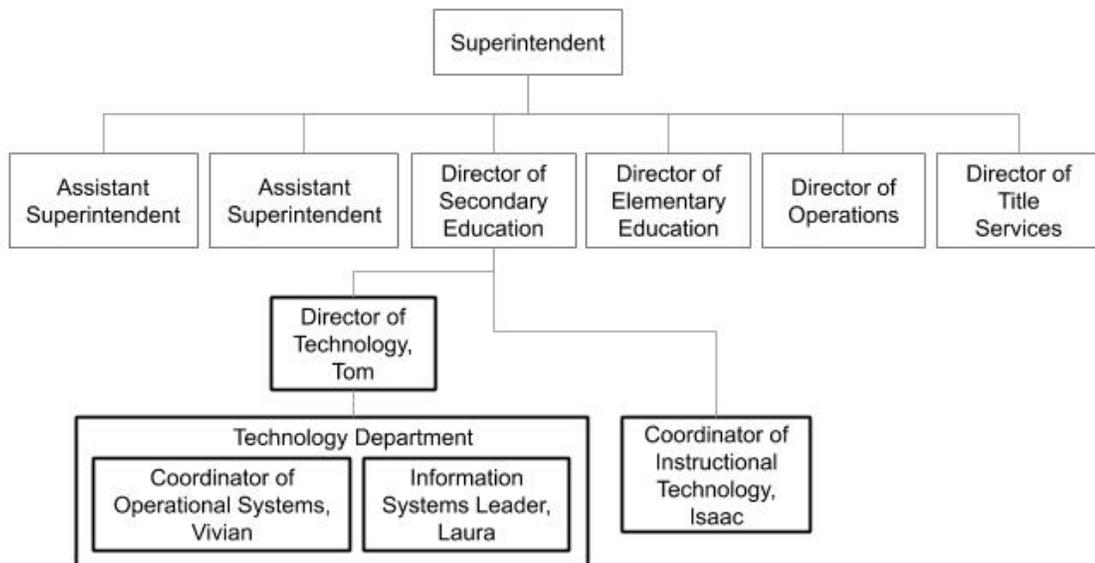
Figure 2. Broad Ridge Independent School District organizational chart. This figure illustrates the components of the LEA's structure that were important to its technology accessibility work. The individuals and departments that were heavily involved in the work appear in bold.

At the time of the study, Isaac worked alongside the technology department but was not a member of the department; his work centered around the procurement, implementation, and use of technology and digital resources (e.g., digital curricular materials) for instructional purposes. Isaac had a background in education and was a

classroom teacher before taking on a leadership role in instructional technology. Since the study concluded, Tom has retired and Isaac has been promoted to take his place.

Keystone School District. Located in a very rural county in Kentucky with a population of approximately 20,000 (U.S. Census Bureau, 2010), the Keystone School District had just over 2,800 students, over 300 of whom received special education services (U.S. Department of Education, 2018). The six schools that comprised the LEA were located in a rural locale. The school was led by a team of administrators that included the Superintendent, two Assistant Superintendents, the Chief Information Officer (CIO), the Financial Officer, and the Director of Special Education.

The LEA's technology accessibility work was led by the CIO, Ben, who reported directly to the Superintendent. Ben had a background in education and had served as a classroom teacher and principal before taking the position of CIO. Ben also had a family connection to disability, which he made a point of sharing with me during our interviews, as the connection made technology accessibility important to him. Ben worked with Brice, the Director of Special Education, on AT-related matters, but Brice was not heavily involved in the LEA's technology accessibility work. Brice had a background in special education and self-identified as a laggard when it came to technology; he explained that he was not very good with technology and preferred to work with paper, a fact reinforced by the numerous piles of paper scattered around his office.

The LEA began work to improve the accessibility of its website after Ben learned, at a regional meeting of K-12 CIOs, that neighboring LEAs had received OCR complaints due to the inaccessibility of their websites. Keystone never received an OCR complaint, but nevertheless the LEA continued to work on their website's accessibility.
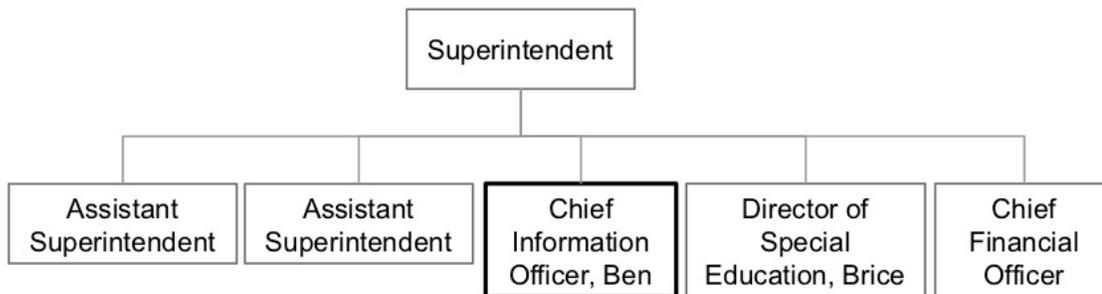
Figure 3. Keystone School District organizational chart. This figure illustrates the components of the LEA's structure that were important to their technology accessibility work. The individual most heavily involved in the work appears in bold.

Mount Elison Schools. Located within the metropolitan area of a city in Missouri with a population of almost 3 million (U.S. Census Bureau, 2010), Mount Elison Schools served almost 18,000 students. Just over 2,000 of the LEA's students received special education services (U.S. Department of Education, 2018). The 23 schools that constituted the LEA were all situated in a suburban locale. The LEA was led by a team of administrators composed of the Superintendent, the Chief Academic Officer, the Chief Communications and Community Relations Officer, the Chief Human Resources Officer, and the Chief Operations Officer.

Mount Elison's technology accessibility work was led by the Coordinator of Occupational Therapy and Physical Therapy (OT/PT), Rosie, who also served as the ADA Compliance Officer; in both roles, she reported to the Director of Special Education, who in turn reported to the Chief Academic Officer. Rosie was an OT by training and had been with the LEA for over 20 years. In her role as the ADA Compliance Officer, Rosie led the LEA's ADA Committee, which comprised

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stakeholders from across the LEA, including parents and disabled students. The

committee worked proactively to ensure that all of the LEA's programs and services were

accessible and did not discriminate against disabled people. This work included

conducting self-assessments of the accessibility of built environments, improving the

accessibility of the LEA's website, and evaluating the accessibility of digital instructional

materials and technologies during procurement.
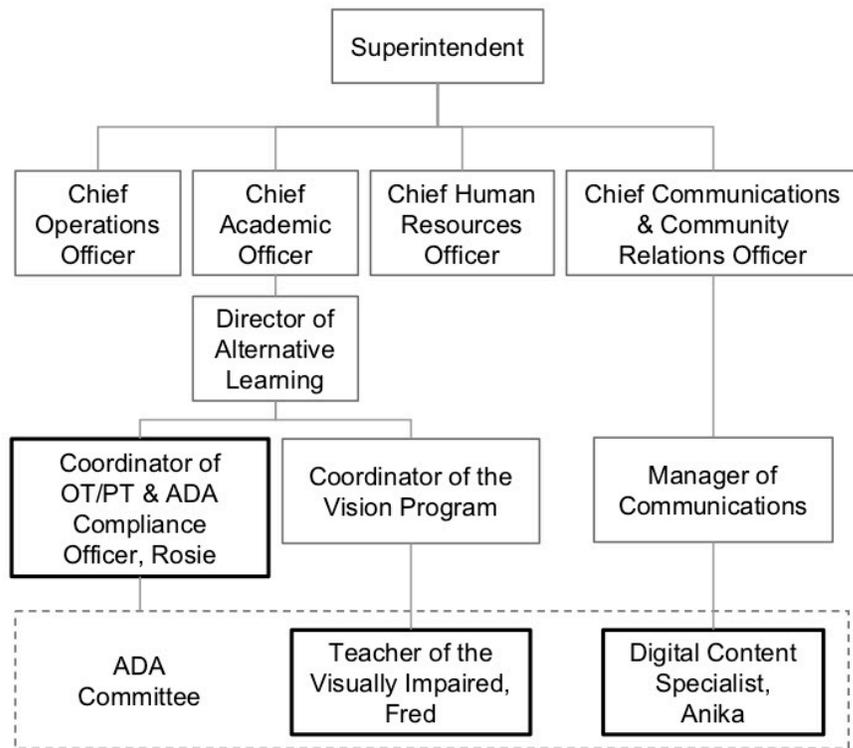
Figure 4. Mount Elison Schools' organizational chart. This figure illustrates the

components of the LEA's structure that were important to the technology accessibility

work. The individuals who were heavily involved in the work appear in bold.

To facilitate the LEA's technology accessibility work, Rosie worked closely with

two members of the ADA Committee: Fred, a Teacher of the Visually Impaired (TVI),

and Anika, the Digital Content Specialist. Fred, who had worked with blind students in

the LEA for over 15 years, reported to the Coordinator of the Vision Program, who in turn reported to the Director of Special Education. Anika had a background in communications and was responsible for the LEA's 26 websites; she reported to the Manager of Communications, who in turn reported to the Chief Communications and Community Relations Officer.

Milford Point School Corporation. Located in a small Michigan city with a population of approximately 30,000 (U.S. Census Bureau, 2010), Milford Point School Corporation served almost 9,000 students, just over 1,000 of whom received special education services (U.S. Department of Education, 2018). The 16 schools that constituted the LEA were situated in a small suburban locale. The school was led by a team of administrators composed of the Superintendent, the Executive Director of Instructional Services, the Executive Director of Business Services, the Executive Director of Operations and Innovation, and the Executive Director of Employee and Student Services.

Milford Point's technology accessibility work was managed by Anthony, the Accessibility Coordinator and the sole employee in the LEA's Accessibility Department; the department was supervised by the Executive Director of Operations and Innovation. Anthony had a background in educational technology and had supported the LEA's teachers in integrating technology into the classroom prior to becoming the Accessibility Coordinator. The LEA established the Accessibility Department and its technology accessibility initiative after receiving an OCR complaint regarding the inaccessibility of its website, which resulted in a resolution agreement between the OCR and Milford Point in the fall of 2016. The LEA's technology accessibility work was driven by the

provisions of the resolution agreement and included the development of policy, the

revamping of the website to bring it into compliance with web accessibility guidelines,

staff training, and web accessibility audits.
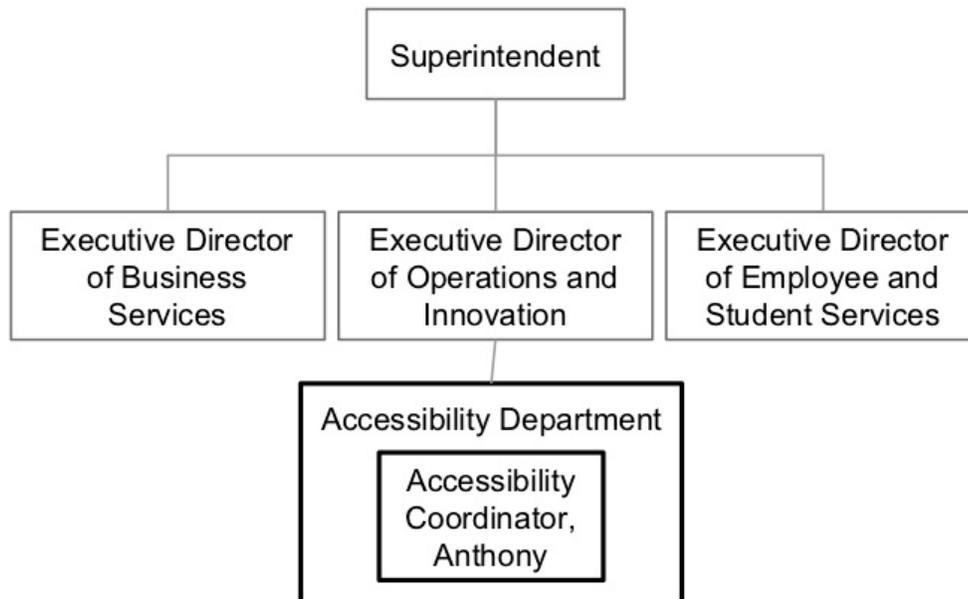
*Figure 5*. Milford Point School Corporation's organizational chart. This figure illustrates

the components of the LEA's structure that were important to their technology

accessibility work. The individual and department that were most heavily involved in the

work appear in bold.

Mishawaka Area Co-Op. Located within the metropolitan area of a Michigan

city with a population of approximately 800,000 (U.S. Census Bureau, 2010), Mishawaka

Area Co-Op was an LEA whose primary role was to support school districts in providing

programming, such as special education services and vocational education, to their

students. Mishawaka provided support to 11 public school districts, seven charter

schools, and 18 non-public schools, all of which were located in an exurban locale. The

LEA also directly served just over 1,200 students, approximately 300 of whom received special education services, in its vocational, transition, and community-based education programs (U.S. Department of Education, 2018). The LEA was led by a team of administrators composed of the Superintendent, the Deputy Superintendent, the Assistant Superintendent of Instructional Services, the Assistant Superintendent of Special Needs Services, and the Assistant Superintendent of Technology Services and Operations.
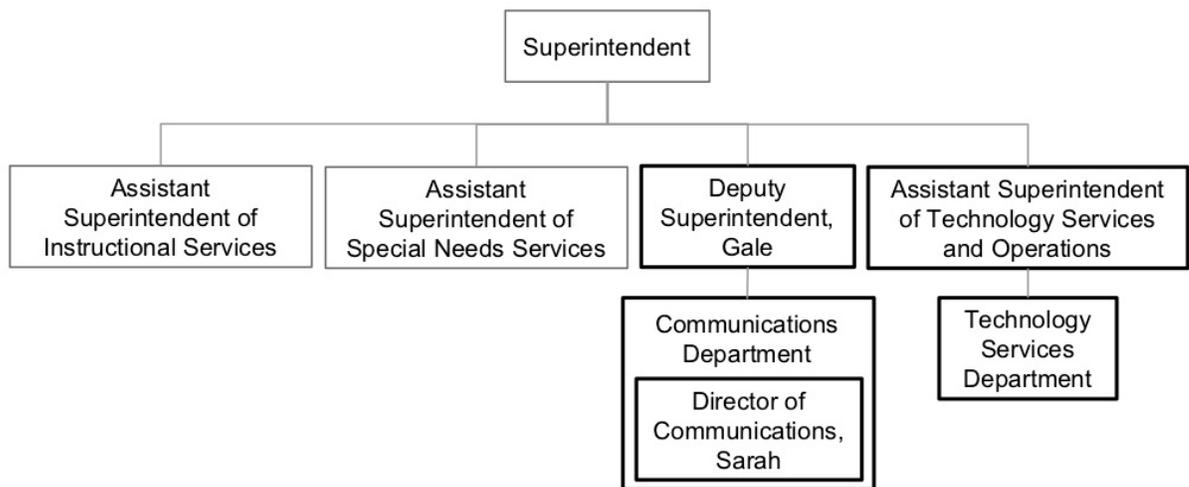
Figure 6. Mishawaka Area Co-op's organizational chart. This figure illustrates the components of the LEA's structure that were important to their technology accessibility work. The individuals and departments that were heavily involved in the work appear in bold.

The LEA's technology accessibility work was led by Gale, the Deputy Superintendent; the Assistant Superintendent of Technology Services and Operations, who unfortunately was not available to participate in the study; and their respective staffs. Gale had a background in human resources and communications, and the Assistant Superintendent of Technology Services and Operations had a background in information

technology. Sarah, the Director of Communications, reported to Gale and was the member of Gale's staff who was most involved with the technology accessibility work. Sarah had a background in communications and project management. The LEA began its technology accessibility work when other LEAs in the state began receiving OCR complaints. The LEA's technology accessibility work primarily consisted of providing training and resources about technology accessibility to the school districts that it supported.

Participants

This section details how the individuals at each of the LEAs introduced above were selected to participate in the study. To participate in the study, individuals had to meet the following criteria: (a) be an LEA stakeholder at one of the sites, (b) be intimately involved in the technology accessibility enactment process, and (c) be at least 18 years of age. Sixteen individuals participated in a total of 20 interviews for the study.

The initial sampling phase for the study was purposive, focusing on stakeholders who were actively involved in the enactment process (Creswell, 2013). Participants were LEA-level (as opposed to building-level) employees and held positions such as Chief Information Officer, Director of Special Education, Coordinator of Instructional Technology, Deputy Superintendent, Itinerant TVI, and Director of Communications. In subsequent sampling phases, I used theoretical sampling, a hallmark of any grounded theory methodology (Charmaz, 2014), to identify appropriate participants and policy artifacts. In her seminal book on CGT, Charmaz analogized the movement from initial to theoretical sampling in CGT to the use of a camera with multiple lenses: "Similar to a camera with many lenses, first you view a broad sweep of the landscape. Subsequently,

you change your lens several times and shorten your focal points to bring key scenes closer and closer into view" (Charmaz, 2014, p. 26). In other words, the initial sampling phase provides a broad view of the topic of inquiry. With a broad understanding of the topic, the researcher engages in theoretical sampling by identifying the aspects of the topic that need to be further explicated and determines what sample will provide the necessary additional detail.

I followed Charmaz's example in moving from initial to theoretical sampling. After I collected and coded the initial set of data (tasks that occurred almost simultaneously), I began theoretical sampling by examining the memos I had already written and systematically reviewing the identified tentative categories to determine what additional data were needed to fill out the various properties of each tentative category (Charmaz, 2014). This iterative systematic process continued until no new categorical properties emerged, until the categories were saturated. Once saturation was reached, theoretical sampling and data collection ceased. Details about the data collected during initial and theoretical sampling are offered in the data collection section.

Charmaz (2014) asserted that there is no ideal sample size for CGT; rather, she explained that researchers must determine the size of the sample based on the particulars and aims of their study. The sample of participants combined with the sample of policy artifacts that were analyzed, an aspect of the study that is discussed in more detail later in the chapter, fit the guidance from Charmaz and were sufficient to accomplish the aims of this study—to construct a theory about the process of technology accessibility policy enactment across diverse K-12 settings.

Data Collection

As is the case with many grounded theory studies (Charmaz, 2014; Glaser &
Strauss, 1967), the primary form of data collection in this study was interviews with
actors who played a key role in the enactment process. In addition to interviews, artifacts
also served as significant forms of data. In this study, I conducted a total of 20 interviews
and collected a total of 38 artifacts across two sampling phases, as outlined in Table 2. I
obtained Institutional Review Board (IRB) approval before collecting any data (Towson
University IRB #1711026712; see Appendix A for additional detail). The remainder of
this section will provide detail about how data were collected through both interviews
and artifact acquisition.

Table 2

Data Collection and Sampling

Sampling phase	Time frame	Participants	Interviews	Artifacts
Initial sampling	2/1/18–3/1/18	14	14	0
Theoretical Sampling	2/16/18–12/22/18	6[a]	6	38
Total sample		16	20	38

[a] Two of the participants interviewed during theoretical sampling were new to the sample.
They were not interviewed during initial sampling.

Interviews

As mentioned above, 16 participants at five LEAs were interviewed throughout
the course of this study. Four participants were interviewed twice—once in the initial

sampling phase and then a second time during the theoretical sampling phase (explained at greater length later in this section). This resulted in a total of 20 interviews ranging in length from 29 to 71 minutes, with the majority lasting 50 or more minutes. Fourteen participants were interviewed in the initial sampling phase. These were the individuals that the LEAs identified as being actively engaged in their technology accessibility work. Six participants were interviewed during the theoretical sampling phase. Four of the six had participated in the initial round of interviews and were selected because it was clear from the initial interview that they had additional knowledge and experience related to the tentative theoretical categories, which emerged from early data analysis. The two other participants interviewed during theoretical sampling were new to the sample and had not been interviewed previously. The two new participants were mentioned in initial interviews with other participants, were actors in the enactment process, and had knowledge and experience related to the emerging theoretical categories. A complete list of participants and interviews can be found in Appendix B.

Following Charmaz's (2014) recommendation and common practice in CGT, all 20 interviews utilized an intensive interviewing format, a structure that creates space for participants to share and reflect upon their experience with the phenomenon of interest. In intensive interviewing, researchers select participants who have in-depth personal experience with the topic of investigation; ask open-ended questions; endeavor to understand participants' "perspective, meanings, and experience" (Charmaz, 2014, p. 56); let participants do most of the talking; and investigate unexpected topics about which participants may hint.

While interviewing in CGT shares many commonalities with other forms of qualitative interviewing, the CGT form of interviewing is different in its purpose and in how both individual interviews and interview sequences proceed (Charmaz, 2014). The purpose of interviewing in CGT is to learn about the phenomenon of interest while advancing theory construction; other qualitative researchers are not concerned with theory construction and thus do not approach interviews with that purpose.

Furthermore, because the aim of interviewing in CGT is to advance theory construction, the way that each interview unfolds differs from other qualitative methods. CGT researchers depart from most of their qualitative cousins and take more direct control over the flow of the interview, continually focusing the exchange on the theoretical categories that have emerged (Charmaz, 2014). If an interviewee briefly touches upon one of the researcher's emerging theoretical categories, the researcher will probe that topic to gather more information. For example, in an initial interview for this study, one participant mentioned addressing technology accessibility during the procurement of instructional resources and technologies, and since procurement had already emerged as a tentative theoretical category in the analysis, I asked the participant for more details about various aspects of that work.

A similar focused movement can also be seen in the sequencing of interviews within a CGT study. In the first round of interviews, the initial sampling phase, the researcher speaks to a broader audience with the intention of uncovering traces of building blocks that can then be used to construct potential theoretical categories. In subsequent theoretical rounds of interviews, the CGT researcher only speaks with the participants that she feels can help explicate the emerging theoretical categories. For

example, during the initial sampling phase I interviewed three participants at Mount

Elison Schools. During theoretical sampling, I only interviewed the one participant who I

felt had additional information that was relevant to the emerging theoretical categories.

Additionally, during an initial interview at Milford Point, the participant mentioned that

the training workshop that he and LEA leaders had attended was critical to its enactment

process; consequently, during theoretical sampling, I interviewed the person who

organized and facilitated that training.

Interviews in this study produced descriptive data (e.g., the number of people

involved in the enactment process, the types of technology being used in the LEAs), data

about the LEAs' technology accessibility policy enactment processes, data about the

LEAs' experience engaging with that process, and data about the meanings and language

that various actors in the processes ascribe to those experiences. Congruent with the

intense interviewing technique, questions were designed to elicit participants' meanings,

experiences, and perceptions of the enactment process (Charmaz, 2014). Initial interview

questions included:

- Can you tell me the story of how the LEA came to work on technology
  accessibility?

- Can you tell me about the work the LEA is doing in the area of technology
  accessibility now?

- Can you tell me about your role in the LEA's accessibility work?
  Interview questions used during theoretical sampling included:

- Can you tell me about the time you first heard about accessibility?

- Can you tell me in your own words what technology accessibility means?

- Can you tell me about the experience of getting started with accessibility work?

A complete list of interview questions that were used during both initial and theoretical sampling phases can be found in Appendix C. During both rounds of sampling, interview questions also emerged from the conversation. I incorporated the participants' words into the questions I asked, I probed for the participants' meanings of the concepts discussed, and I attempted to elicit the participants' experiences without leading the participants (Charmaz, 2014). For example, in an initial interview, one participant mentioned that she wished the procurement process that the LEA undertook with publishers and vendors "had more teeth." I followed up on her comment with the following question, "So tell me about 'having more teeth'; what would that look like?"

Interview modality. To the extent that it was pragmatic, given that the LEAs were located in several states around the country, initial interviews were conducted face-to-face. Initial interviews at the two LEAs farthest from my location were conducted remotely, as were all follow-up interviews. Scholars have argued that both telephone and online synchronous interviewing, using technology such as Skype, are effective methods for conducting interviews with geographically dispersed participants (Deakin & Wakefield, 2014; Hana, 2012; Oates, 2015; Seitz, 2016; Sullivan, 2012; Trier-Bieniek, 2012). The scholars suggested that telephone and Skype interviews have both advantages and disadvantages when compared to traditional face-to-face interviews. The advantages of remote interviewing techniques over face-to-face interviewing include scheduling convenience and flexibility, decreased travel expenses and burden for both the participant and the researcher, a decrease in the participant's perception of coercion to obtain

consent, and increased physical safety for both parties who are strangers to one another (Deakin & Wakefield, 2014; Oates, 2015; Sullivan, 2012). Conversely, the disadvantages of remote interviewing compared to face-to-face interviewing are technical difficulties causing a disruption in the connection between participant and interviewer, the need for a strong and stable Internet or phone connection, and difficulty discussing sensitive topics due to emotional barriers created by the digital environment (Deakin & Wakefield, 2014; Seitz, 2016).

In this study, the participants and I experienced the advantages of remote interviewing, most notably the ease and flexibility of scheduling. For example, one participant had to cancel an initial interview at the last minute because an urgent and unexpected task came up an hour prior to the scheduled interview. Since we were meeting remotely, he felt more comfortable canceling at the last minute as he knew the change in schedule would not inconvenience me the way it might have had I traveled across the country to meet with him. Similarly, I was relieved that the participant did not feel obligated to put himself under unnecessary stress to keep our appointment when there was urgent work that required his attention.

I also experienced the technical difficulties discussed in the literature while conducting this research. I attempted to conduct the first two remote interviews using video conferencing software, but the participants experienced technical glitches. Luckily, we were able to quickly transition to phone interviews, as I had anticipated the possibility of a technical malfunction. In conducting subsequent remote interviews, I defaulted to using the telephone to avoid any frustration participants might experience when confronting technical glitches. Regardless of the setting (analog or digital), all of the

interviews in this study were audio recorded after participants provided the requisite consent. Interview recordings were subsequently transcribed verbatim to facilitate data analysis, a technique that Charmaz (2014) advocated over just taking notes during the interview as objectivist grounded theory advocates (Glaser, 1978). Interview transcripts were de-identified through the use of pseudonyms for individuals, LEAs, and third parties who were closely linked to the LEAs (and whose names might have revealed the true identity of the LEAs). Consequently, all proper nouns that appear in chapters 3–5 are pseudonyms unless otherwise specified.

Artifacts

In addition to interviews, I also collected artifacts (e.g., policy documents, web pages, training materials) that were relevant to the LEAs' technology accessibility policy enactment processes. The use of artifacts as sources of data is congruent with data collection techniques used in the past by researchers employing grounded theory methodologies. According to Charmaz (2014), grounded theorists have used artifacts as both primary data sources (e.g., Clarke, 1998) and as secondary data sources to expand upon data collected through interviews (e.g., Chen, 2011). Artifacts were selected as data sources for this study because they complemented the data collected through interviews in three significant ways. First, artifacts, particularly documents, play a large role in the policy enactment process and, therefore, were irreplaceable sources of data in this study (Ball et al., 2012; Ozga, 2000; Taylor et al., 1997). Second, artifacts are relatively unobtrusive to collect (Charmaz, 2014), which allowed me to gather additional information without further burdening participants. Third, data generated from the

artifacts helped to triangulate data generated through participant interviews, thereby bolstering the credibility of the study (Creswell, 2013; Merriam, 2009).

The 38 artifacts that comprised the sample were collected during the theoretical sampling phase. Consequently, artifacts were selected because they (a) were an integral part of the technology accessibility policy enactment process at an LEA, and (b) contained information that would help to further explicate the emerging theoretical categories. Artifacts were obtained in the following ways: participants shared artifacts directly with me; participants referenced an artifact in an interview and I subsequently obtained this artifact by searching publicly available information (e.g., an OCR complaint); and I obtained artifacts by directly reviewing publicly available information (e.g., an LEA's website accessibility policy posted prominently on their home page). The artifacts that were used in this study were produced by a variety of authors including but not limited to the LEAs themselves, the federal government, consultants, and state or national educational organizations that provide technical assistance. The types of artifacts I collected include OCR complaints and resolution agreements, training materials and resources, artifacts related to LEA procurement processes, LEA web accessibility policies, grant applications, timelines, and accessibility evaluations. Once collected, all artifacts were assigned a pseudonym to protect the identity of the LEA, as well as an artifact identification number. A complete list of the artifacts that comprised the sample can be found in Appendix D.

Data Analysis

Data collection and analysis occurred almost simultaneously in this study using the constant comparative method, one of the defining features of grounded theory

(Charmaz, 2014; Creswell, 2013). The constant comparative method, as Creswell (2013) described it, can be conceptualized as a zigzag where the researcher goes into the field to collect data, heads back to the office to code the data, goes back into the field to collect more data, and then returns to the office to code those data. In this study, I often collected data during part of the day and spent another portion of the day engaged in early analysis of data that had been previously collected. In other cases, I spent the morning collecting artifacts based on what I'd learned from an interview the previous week, and then spent the afternoon interviewing a participant from another LEA. While collecting data at one site, where I interviewed participants over a two-day period, I returned to my hotel after the first day of interviews and engaged in early analysis work; that analysis shaped my approach in conducting subsequent interviews the following day.

In CGT, data analysis consists of both coding and memo writing, or memoing. Through the coding process, the researcher constructs building blocks of theoretical categories, and through memoing, the researcher integrates and arranges the building blocks to construct a theory (Charmaz, 2014). This section describes the data analysis process in detail, including the two phases of coding, the process of artifact analysis, the memoing techniques I employed, and how I constructed the substantive theory.

Coding

The constant comparative method, which I used to almost simultaneously collect and analyze data, was also used during the coding process to compare data to data (e.g., comparing statements within a single interview, comparing one interview to another interview, or comparing an interview to an artifact) and to compare data to codes (Charmaz, 2014). Utilizing the constant comparative method during data analysis allows

the researcher to begin developing theoretical categories and thereby advances theory construction, which is the primary focus of grounded theory.

Following the guidelines of CGT, coding occurred in two distinct phases, initial coding and focused coding, and I used the constant comparative method during both phases. During the initial coding phase, I constructed codes by naming each segment of the data, line by line (Charmaz, 2014). Remaining open to all theoretical possibilities, in the initial coding phase, I looked for "action" in the data, as opposed to topics or themes; therefore, I predominantly employed gerunds as codes (Charmaz, 2014). For example, in coding a few sentences in an interview where a participant described his experience at an accessibility professional development workshop, I used the code *learning about accessibility* (coding for action) as opposed to *professional development* (coding for themes).

In focused coding, grounded theorists sort and synthesize the existing data, which were first coded during the initial coding phase, looking for the initial codes that will serve as the most useful analytical tools or developing comprehensive codes to classify several initial codes (Charmaz, 2014). As a result, "focused coding directs data analysis early in the research process" (Charmaz, 2014, p. 138). To illustrate how focused coding unfolded in this study, two examples follow. During focused coding, I subsumed three initial codes—*disseminating information to school buildings*, *reminding others of accessibility policy*, and *communicating district policy*—into one focused code, *communicating district policy*, an initial code that I elevated to a focused code due to its analytical usefulness. In another segment of the data, I created a new focused code, *building accessibility capacity within the LEA*, that was composed of several initial

codes, including *adding accessibility to new teacher training*, *facilitating accessibility training*, *fielding questions about accessibility*, and *sharing accessibility resources with colleagues*. A complete list of focused codes can be found in Appendix E.

Artifact Analysis

In addition to coding the artifacts in the sample during the initial and focused coding phases, I also analyzed the artifacts through a process of questioning during which I examined them with two overarching questions in mind: What is the content of this document, and what role does this document play in the LEA's technology accessibility policy enactment process? These two overarching questions emerged directly from policy enactment, the theoretical framework for this study. Ball (1993) insisted that policy is both text and discourse and that the two are co-constituted. Consequently, it would be incongruent with the framework to examine the content of a document without also examining how that document fits into the dynamic nonlinear process of policy enactment in the given context. Drawing on suggestions from Charmaz (2014), I also asked questions such as the following: What did the authors hope to achieve with the document? How was the document produced? What and who did the document affect? How did different actors make sense of the document? What is not included in the document? What implicit meanings does the document contain? The artifact questioning process was documented in memos, specifically analytical memos, which will be discussed in the following subsection.

Memoing

Memoing is a key component of the analytic process for all CGT studies, including this one, as memoing facilitates the movement from data to theory (Lempert,

2007). Memos are informal analytic notes that the researcher writes to herself about her emerging ideas throughout the research process. As Charmaz explained, "… memo-writing forms an interactive space and place for exploration and discovery" (2014, p. 170). In other words, in drafting notes to herself, the researcher engages in an ongoing conversation with her ideas as she explores the phenomenon of interest and constructs a theory about it.

Memo writing occurred throughout the entire research process; as Charmaz (2014) suggested, I wrote memos each time an analytic idea arose. As the study progressed, my memos became increasingly more analytic. The memos I wrote served as a set of tools to advance theory construction. In accordance with CGT, my memos did not, however, serve as data and thus were not coded alongside interviews and artifacts, as sometimes occurs in other qualitative methodologies.

In line with the intentionally flexible and open-ended methodology of CGT, there is, of course, no prescription for writing memos. Charmaz (2014) did, however, suggest that keeping a chronological memo bank—a place to store all memos—as well as a methodological journal—a place to document methodological quandaries and decisions—was an effective strategy for staying organized. I followed Charmaz's advice and kept a chronological memo bank, which included three different types of memos: analytic memos that documented my emerging ideas about the phenomenon of interest; reflexivity memos where I recorded my feelings about the process and interrogated my conceptions of the phenomenon and the role my views played in the research process; and methodological memos where I chronicled methodological decisions and progress. I wrote a total of 544 memos, of which 411 were analytic memos, 59 were reflexivity

memos, and 74 were methodological memos. To illustrate the content of each type of memo, a few sample memos can be found in Appendix F.

Constructing the Theory

As discussed above, I constructed the small building blocks of the substantive theory during initial coding, I constructed larger building blocks during focused coding, and I arranged those building blocks into a theory through memoing. In alignment with CGT and the interpretivist worldview, the substantive theory that I constructed provides an explanation of technology accessibility policy enactment based on my interpretations of the phenomenon and situates those abstractions firmly in the context in which they were constructed. In theorizing, I did not endeavor to discover a universal explanation of a singular reality to facilitate prediction or hypothesis generation. Rather, my substantive theory endeavors to provide a detailed explanation and interpretation of how the five participating LEAs enacted technology accessibility policy and why the process unfolded as it did; this knowledge can be transferred to similar contexts to begin to understand the technology accessibility policy enactment processes in those locales. This section articulates how I constructed the theory from the data, describing the messy process as a series of six steps that occurred after focused coding and providing an illustrative example of each step.

First, I compared the focused codes and the existing analytic memos in order to construct tentative categories. Tentative categories that resulted from this step included *negotiating competing priorities*, *building knowledge from scratch*, *hearing about accessibility policy*, and *honing accessibility*. Second, I examined the tentative categories to determine where more data were needed and subsequently collected those additional

data through theoretical sampling. For example, to further explicate the tentative category of *building knowledge from scratch*, which I felt was not yet saturated, I: (a) conducted a second round of interviews with several participants, including Tom from Broad Ridge and Rosie from Mount Elison; (b) conducted an initial interview with John of Access Ed; and (c) collected training materials (e.g., slide decks from workshops, resources).

Third, I coded the new data and wrote additional analytic memos. For example, while coding the second interview with Ben, I wrote a memo (*Upset that Advocate was Outside the District*) in which I outlined the affective response Ben and his colleagues had when they first heard about accessibility policy. Fourth, I compared focused codes, tentative categories, and analytic memos to construct the initial theoretical categories. Initial theoretical categories included *hearing about accessibility*, *working on accessibility*, and *expanding accessibility work*. Fifth, I repeatedly compared, rearranged, and integrated my initial theoretical categories to construct a more abstract understanding of the process and my final theoretical categories. The final theoretical categories, which are discussed at length in the following chapter, included but were not limited to *becoming aware*, *practicing*, and *iterating*.

Finally, through successive diagramming, I outlined the relationships between the theoretical categories. For example, through successive analysis and diagramming, it became clear that *strategizing*, *learning*, and *practicing* were very closely related components of the enactment process that often occurred simultaneously and informed one another; consequently, I depicted the three categories as three triangles arranged to form a larger triangle, as shown in Figure 7.

Each of the aforementioned steps of the theory construction process was documented in analytic memos. For example, my tentative categories, the initial theoretical categories, and the relationships between my final theoretical categories were all outlined in individual memos that were linked to each other and to the raw data where needed. Note that while I have described the theory construction process in a stepwise linear fashion to facilitate the reader's understanding of the work, in practice, theory construction unfolded in a much more organic way, as some steps overlapped and others occurred in a cyclical manner.

Researcher Role and Reflexivity

Operating from a worldview that acknowledges that social reality is multiple, CGT affirms the researcher as a fundamental part of the "research reality" (Charmaz, 2014; Clarke, 2005), which is constructed by the researcher and the participants from their prior experience and beliefs as well as their work within the specific setting. Therefore, unlike objectivist forms of grounded theory, which view the researcher as a neutral observer, CGT positions the researcher as central to the construction of research and thus cultivates researcher reflexivity (Charmaz, 2014). As with other qualitative methods, where the researcher is the primary instrument (Creswell, 2013; Merriam, 2009), it is important that researchers utilizing CGT are transparent about (a) how their beliefs about the phenomenon under study come into play throughout the research process, and (b) the role the researcher takes in the study. In this section, I outline my beliefs about the phenomenon of inquiry and how I feel my beliefs came into play in the study as well as the role that I took in the research.

My beliefs about technology accessibility, the rights of disabled people, and the realities of K-12 education shaped aspects of the research process. First, I feel strongly that disabled people have the legal right of equal access to all aspects of the learning environment, including technology. This belief contributed to the policy focus of this research, as well as an interest in how disabled people's rights and needs were incorporated in the enactment process. Second, I believe that the law is a useful tool in defending disabled people's rights to equal access; however, I do not believe that the law alone can mitigate the inequality that disabled people confront in K-12. Therefore, the research examined both legal and extralegal factors and actors that contributed to the enactment process. Third, I believe that schools are more complex environments than they may appear from afar and that each school has its own unique context that must be understood; moreover, I believe that a school's specific context shapes its enactment process. Therefore, this study examined schools with different contexts to generate an understanding of how different school contexts tailor the technology accessibility policy enactment process.

In relationship to this research, I was both an insider and an outsider. As a former classroom teacher, I am familiar with both K-12 discourse and professional norms. However, I had no knowledge of or relationship with any of the LEAs or participants in this study prior to beginning the research. In most cases, I was introduced to the LEAs through professional contacts of mine who were familiar with the LEAs; the introductions my colleagues offered eased my entry into the field and made participants more willing to speak with me. In a few cases, however, I was connected to the LEAs

through cold emails, positioning me more as an outsider as I entered the field at those sites.

At times while in the field, I felt like an insider. I had been in situations similar to those participants spoke of in interviews, and I could tell similar stories from my time working in K-12. Furthermore, from time to time, participants spoke to me as they would to an insider; they relayed some of their frustrations around trying to make progress on technology accessibility in the same manner they might confide in a trusted colleague who has been in a similar situation and understands the frustration firsthand. I imagine that the information I shared with participants about my background as well as what they deduced about my position on technology accessibility, given the topic of my dissertation, contributed to some participants' comfort and trust in confiding in me.

Much of the time, however, I played the role of outsider. I did not have intimate prior knowledge of any of the LEAs, nor did I have prior relationships with any of the participants. A few of the participants were noticeably hesitant to speak with me at first. Some participants indicated that they did not feel they would have any useful knowledge or information to share, though they all had a wealth of relevant experience and knowledge to offer. A few participants' hesitation seemed, from my perspective, to stem from a concern about my motives in conducting the research; perhaps they feared that my goal was to evaluate their work or to catch the LEAs doing something "wrong." My goal, of course, was not to evaluate the LEAs' work but rather to understand it, and I did my best to communicate my intentions in my correspondence with participants prior to, during, and after interviews. All of the participants who were initially hesitant became noticeably more comfortable sharing their knowledge and experience as the interviews

progressed. In my interactions with these participants, as I built rapport, I gained some trust, but I remained an outsider.

Another factor that affected my position at some of the research settings was my identity as a blind person, an identity that I made visible by using a long white cane and other nonvisual techniques. Participants who I interviewed remotely may not have realized that I was blind. I did not disclose my disability to those participants, though they could have ascertained that I was blind if they searched my online presence. My disability did not seem to play a role in my interactions with the participants I met virtually. Conversely, I showed up to each of the face-to-face interviews with my white cane in hand; though I did not explicitly say I was blind, those participants who were familiar with the purpose of white canes deduced that I was blind and acknowledged my blindness in our interactions. For example, in our informal conversations outside of the interview, one participant relayed his experience working closely with a blind colleague early in his career and at another time expressed curiosity about my blindness and how I was able to conduct research as a blind person. Those participants who deduced that I was blind and made their deduction apparent to me did not appear to be uncomfortable with my blindness. In at least one instance, with the participant who was a teacher of the visually impaired, my blindness seemed to facilitate rapport building. I did not feel in any of the interviews that my blindness negatively affected what participants were willing to share with me, though it may have caused one participant to make more connections between technology accessibility and blindness than he would have made if he had not known I was blind.

Trustworthiness

The aim of this study was to understand the process by which K-12 LEAs enact technology accessibility. As mentioned previously, I approached this research from an interpretivist worldview, wherein reality is multiple and context dependent (Merriam, 2009; Taylor et al., 1997). Furthermore, this research did not endeavor to test a hypothesis. Consequently, the constructs of validity and reliability as they are conceived in quantitative research are incongruent with the underlying worldview of this research as well as its stated aims. Trustworthiness, however, which Lincoln and Guba (1985) proposed as a qualitative alternative to validity and reliability, is well aligned with the worldview and aims of this study. Lincoln and Guba explained that qualitative research is trustworthy if the findings are plausible based on the data that have been presented. Trustworthiness is composed of three constructs: (a) credibility, establishing confidence in the findings; (b) transferability, providing sufficient detail to allow readers to determine whether or to what extent the findings can be abstracted to other settings; and (c) confirmability, demonstrating that the data are reliable and factual (Lincoln & Guba, 1985).

I employed five strategies to increase the trustworthiness of this research. First, I practiced reflexivity throughout the research process by writing reflexivity memos wherein I critically examined my thoughts and actions and the roles they played in the research process (Lincoln & Guba, 2005). Moreover, I have reported in this manuscript my position, my beliefs, and my values to facilitate the reader's understanding of what I brought to the research. The practice of reflexivity was particularly important in this study given the central role that researchers play in CGT. Second, I used multiple forms

of data (i.e., interview transcripts and artifacts), which facilitated the triangulation of findings, a well-recognized strategy for increasing credibility in qualitative studies (Creswell, 2013; Lincoln & Guba, 1985; Merriam, 2009).

Third, I employed member checking, the process of reviewing emerging findings with participants to ensure their experiences are accurately represented (Creswell, 2013; Merriam, 2009). Member checking occurred in two rounds: during theoretical sampling and after all of the data had been analyzed. During theoretical sampling interviews, I gathered additional data about my emerging theoretical categories and I shared the emerging categories with four key participants, querying them about whether or to what extent those categories matched their experience. After data analysis was complete, I sent a summary of the findings to all participants and received responses from nine participants. In both rounds of member checking, participants indicated that the findings resonated with their experience; a few participants expanded on the findings to offer more detail. Fourth, I utilized thick description in reporting the findings of the study, providing a vivid and detailed account of the enactment process. Fifth, following Charmaz's (2014) recommendations, I maintained a chronological memo bank composed of analytic, methodological, and reflexivity memos that detailed the decisions I made and the path I took in constructing the substantive theory, and the ways in which I interrogated my beliefs and values throughout the research process. This chronological memo bank serves as an audit trail, a series of documents that a third party could use to trace the steps taken to execute a study (Lincoln & Guba, 1985). In sum, this research is trustworthy because I employed techniques for establishing credibility (i.e., reflexivity,

triangulation, and member checking), transferability (i.e., thick description), and

conformability (i.e., audit trail).

Limitations

As discussed previously, this study examined the enactment process at five LEAs

that were actively addressing technology accessibility during the 2018 calendar year by

(a) interviewing LEA stakeholders who were actively engaged in the work, and (b)

collecting artifacts that were central to the work. As a result of the design of this study,

the findings of this research need to be read and understood within the study's key

limitations, which are fourfold. First, the study did not examine the enactment process of

all 17 LEAs that were identified through snowball sampling due to time constraints and

the LEAs' disinterest in participating. As a result, there may be aspects of the enactment

process at the 12 other LEAs that are not addressed in the findings of this study. Second,

the study only examined artifacts that were shared by the LEAs or that could be sourced

via queries of readily available public information; consequently, aspects of the LEAs'

processes that were documented in internal artifacts that were never shared with me or

the public may be missing from the resulting theory. Third, all participants in the study

were stakeholders who were actively engaged in the LEAs' technology accessibility

work; therefore, the findings do not represent the experience, meanings, or perspectives

of those LEA stakeholders who were peripheral to the work. Finally, in alignment with

the CGT approach employed in this study, generalizations of the findings of this study

must remain situated in the place and time in which this research occurred, as

decontextualized generalizations lead to oversimplification (Charmaz, 2014). In other

words, the findings of this study may be transferable to other places and times, but in

transferring the findings, the reader must be cognizant of the context in which this research was conducted and assess the similarity between their context and the context of this study (Merriam, 2009). Despite these limitations, the substantive theory constructed through this study provides an explanation of how five diverse LEAs enacted technology accessibility policy and an interpretation of why they enacted the policy the way that they did—information that heretofore was unavailable in the literature.

Chapter III Summary

This chapter has described, in detail, the CGT methodology used in this study to answer the research questions: What is the process by which K-12 LEAs enact technology accessibility policy? How does that process unfold and why does the process unfold as it does? And how do LEAs engaged in the process make meaning of the experience of enacting technology accessibility policy? The sample was composed of 20 interviews with LEA stakeholders and 38 policy artifacts that were collected from the five participating LEAs. Following the flexible and emergent CGT methodology, this study utilized the constant comparative method, initial coding, focused coding, and memo writing as analytic tools to construct a substantive theory from the data about the technology accessibility policy enactment process. To increase the trustworthiness of the research, I employed the strategies of reflexivity, triangulation, member checking, thick description, and a chronological memo bank. The findings and substantive theory constructed through this research, which explain the process by which K-12 LEAs enact technology accessibility policy, are detailed in the following chapter.

CHAPTER IV

FINDINGS

It's a matter of taking all those people and trying to ride the tsunami wave of

everyone's needs and try and make sure that wave doesn't crash against the

shore…. It means trying to make sure that the job is done so that it benefits people

while at the same time, not making everyone's lives so miserable that they lock

the door as I'm walking up to their building. (Anthony, Milford Point, Interview

1, February 1, 2018)

The previous chapter outlined the methods used to collect and analyze the data in

this study. As discussed in chapter 3, the outcome of a CGT study is a substantive theory

that explains the process of interest: in this case, technology accessibility policy

enactment in K-12. Unlike policy implementation, which conceptualizes policy uptake as

a top-down linear process (Barrett, 2004; Mazmanian & Sabatier, 1989), policy

enactment characterizes policy uptake as a messy, ongoing, and nonlinear process that is

mediated by the context in which it occurs (Ball, 1993, 1994; Braun et al., 2010). The

data from this study reveal that the uptake of technology accessibility policy at the

participating LEAs was also messy, ongoing, and nonlinear. Furthermore, the LEAs'

contexts significantly impacted the ways in which the policies were enacted.

In addition to their individual contexts, the five LEAs were enacting technology

accessibility within a unique and historically significant policy context marked by a flurry

of activity and discussion about technology accessibility in K-12 from 2014 to 2018.

Based on the available literature, the last time technology accessibility was a prominent

topic of discussion in K-12 was at the turn of the century, when Section 508 became law

(Golden & Buck, 2003; Noble, 2005). Two key events created this more modern flurry in K-12: (a) the thousands of web accessibility–related OCR complaints that were filed against LEAs from 2014 to 2018, and (b) the January 2017 update to the Section 508 regulations, both of which were discussed in chapter 2. As a result of these events, technology accessibility and, specifically, web accessibility were prominent topics of discussion at K-12 conferences and regional meetings, as this study's findings reveal. One significant way in which this unique policy context mediated all of the LEAs' technology accessibility enactment processes was to focus the vast majority of the work and discussion on the accessibility of LEA websites, as opposed to technologies used for teaching and learning.

This chapter presents this study's findings, which were constructed from data collected at the five participating LEAs: Broad Ridge, Keystone, Milford Point, Mishawaka, and Mount Elison. While the unit of analysis for this study was the individual LEA, LEAs do not exist apart from the people they employ. Similarly, employees do not exist apart from the LEAs for which they work; LEAs and LEA employees are co-constitutive (Billett, 2008; Imants, Wubbels, & Vermunt, 2013; Lee & Roth, 2007). Therefore, these findings tell the story of how LEAs and the diverse employees that comprise them enacted technology accessibility policy. In this manuscript, the term "LEA(s)" refers to both the organizations and their employees.

Below, the findings are presented in three parts, which correspond to the three research questions that guided the study (see chapter 3). Part 1 explains the process of enacting technology accessibility policy and identifies the five elements of the process: becoming aware, strategizing, learning, practicing, and iterating. Part 2 expands upon the

five elements to detail how the process unfolded over time and why it unfolded as it did.

Part 3 sheds light on the meaning that LEAs made of their experience enacting

technology accessibility policy. Next, the chapter advances the substantive theory, the

Five Elements of Technology Accessibility Policy Enactment (5eTAPE), which

integrates the findings to explain the process of technology accessibility policy enactment

in K-12 LEAs during the unique, and historically significant, policy context of the 2018

calendar year.

Part 1: The Five Elements of the Process

The process by which LEAs enacted technology accessibility policy included five

elements: becoming aware, strategizing, learning, practicing, and iterating. To enact

technology accessibility policy, LEAs had to first be aware of its existence; consequently,

the process always began with becoming aware. Once they were aware of technology

accessibility policy, LEAs proceeded, though not always immediately, to the next

elements of the enactment process: strategizing, learning, and practicing. Given that these

three elements are tightly interrelated and comprise the core work of the enactment

process, throughout this manuscript they are referred to as the SLP stage, a compound

stage of work made up of strategizing, learning, and practicing. Through their

engagement with this stage of work, LEAs organically iterated their technology

accessibility efforts by either (a) broadening the scope of an existing piece of their

efforts, or (b) expanding their efforts to include an additional substantive piece of work.

Through iteration—the final element of the enactment process—LEAs transitioned into

subsequent stages of strategizing, learning, and practicing. The cycle of SLP—iteration—

SLP—iteration was continual, an aspect of the process that will be addressed in Part 2.

Figure 7 depicts the five elements of the process.
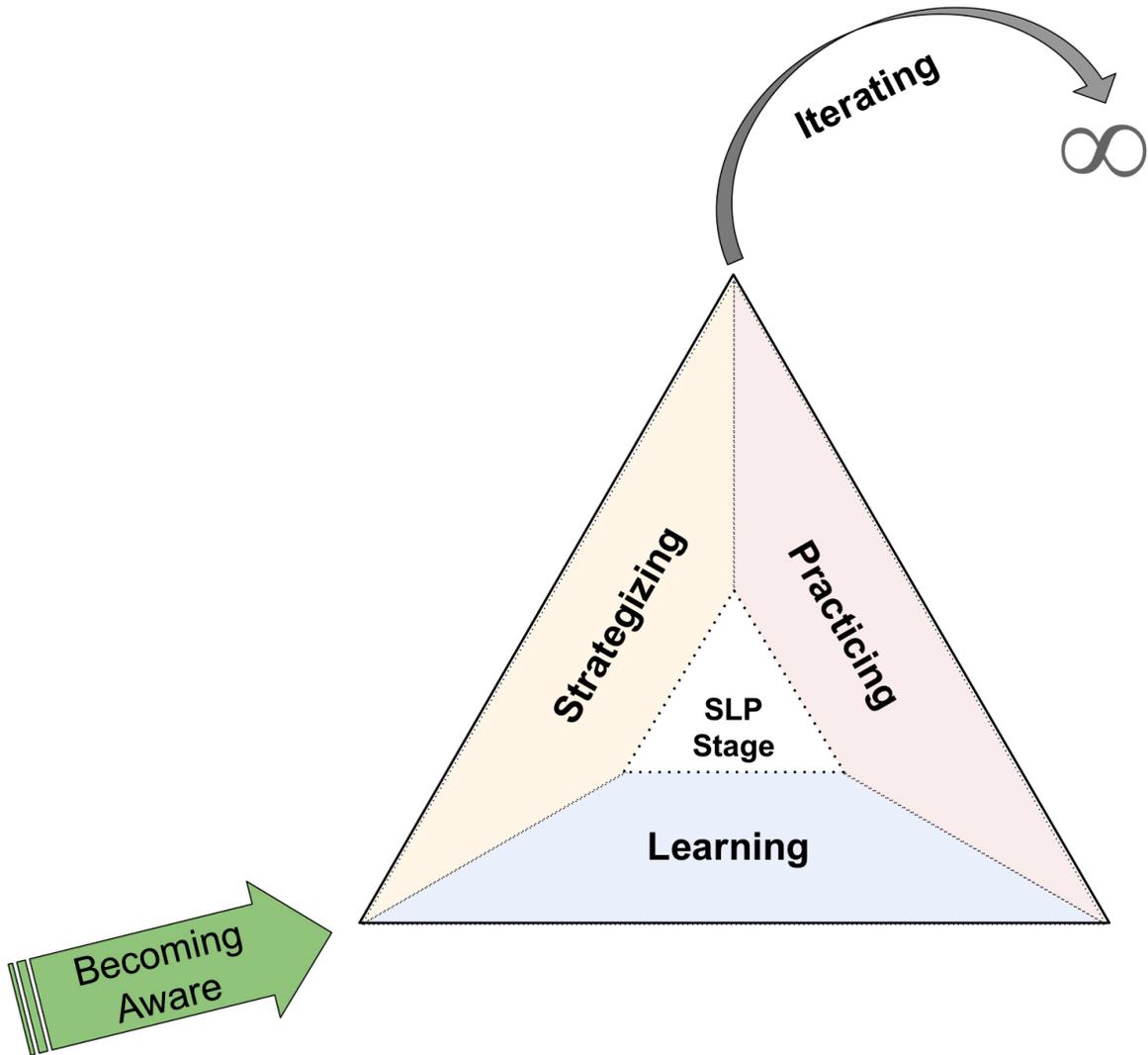
Figure 7. The five elements of the process. This illustration depicts the relationship between the five elements of the process and the relationships between them, as well as the SLP stage, which is composed of strategizing, learning, and practicing.

Becoming Aware

At an organizational level, LEAs became aware of federal technology accessibility policies—the Rehabilitation Act of 1973 and the ADA—as a result of legal action taken against them or other LEAs with which they were familiar (e.g., a neighboring LEA, or an LEA where a colleague worked). In recent years, most of that legal action was initiated by one accessibility advocate who filed a series of thousands of OCR complaints relating to the inaccessibility of K-12 websites, as Anthony, the Accessibility Coordinator at Milford Point, explained:

> There is a lady across here, actually here in Michigan, who took it upon herself to begin the campaign of making sure that websites across the educational areas of the United States were meeting the [accessibility] guidelines.… So, all of a sudden, districts across Michigan were receiving these letters out of the blue from the OCR for noncompliance. (Interview 1, February 1, 2018).

This advocate's impact was not limited to Michigan. The wave of legal activity she initiated influenced the enactment process at all five LEAs in two ways. First, the OCR complaints brought the matter to the LEAs' attention. Second, the web accessibility–focused complaints encouraged LEAs to focus their technology accessibility efforts on their websites, as will be discussed later in the chapter.

Two of the LEAs that participated in this study, Milford Point and Broad Ridge, received OCR complaints directly. The correspondence these LEAs received from OCR identified the federal laws that they were purportedly violating: "the complaint alleged that the District's website is not in compliance with Section 504 and Title II because it is inaccessible to adults and students with visual impairments and other disabilities" (OCR

Letter, Artifact MP12). As Anthony mentioned above, these OCR complaints caught the LEAs off guard. The LEAs were surprised because they were not aware of the technology accessibility policy: "There truly was not any knowledge within our district that we had done anything wrong in the beginning.… We thought everything was great and wonderful until all of a sudden we got contacted by the OCR out of the blue" (Anthony, Milford Point, Interview 1, February 1, 2018). Laura, the Information Systems Leader at Broad Ridge, had an experience that mirrored Anthony's: "So really a lot of this has just been just more brought to our attention and us responding to it… November, a year ago November, we got a letter from the OCR saying that we were out of compliance" (Interview 1, February 16, 2018). For Milford Point and Broad Ridge, receiving official correspondence from OCR was a critical moment in their enactment process. It was the point at which the LEAs transitioned from complete ignorance to the most basic level of awareness: knowledge that the policy existed. At this critical moment, the LEAs also had to make some decisions, which will be discussed in more detail later in this section.

The three LEAs that did not receive legal action directly became aware of technology accessibility as a result of legal action taken against LEAs with which they were familiar. For example, at a regional meeting for LEA technology leaders, Ben, the CIO at Keystone, learned about legal action taken against an LEA in Kentucky: "… it was one of our districts. It was probably a couple hours from here. And they had a complaint filed by the Office of Civil Rights [*sic*]" (Interview 1, February 26, 2018). Gale, the Deputy Superintendent at Mishawaka, observed what Anthony called the OCR complaint "crusade" moving across Michigan: "… the OCR complaints that were being

filed, kind of brought to our awareness this issue of accessibility.… It was some districts in a far, far away place and then pretty soon it was getting closer and closer to home" (Interview 1, March 1, 2018). A resource called *Getting Started with Accessibility*, which was developed by a professional organization of K-12 leaders and used at Broad Ridge, underscored the point that legal action begat awareness in many LEAs across the country: "Unfortunately, many state and district leaders become aware of the importance of accessibility only when faced with legal action" (Artifact BR3).

Due to their lack of prior knowledge about technology accessibility and the related policy, the LEAs were caught off guard and frequently ill-prepared to respond to the legal actions. As Anthony suggested, "[b]ecause this was a case that was brought to our attention, we were playing catch up from the beginning" (Milford Point, Interview 1, February 1, 2018). Anthony was not the only one who felt like he was "playing catch up"; the sentiment was shared across all five LEAs at this stage in the process. The LEAs did not know how to proceed after receiving the OCR complaints: "… How do we make this happen? Especially in the area of the websites, because we really didn't understand what we needed to do, just knew that it was an issue" (Tom, Broad Ridge, Interview 2, July 11, 2018). Anika, the Digital Content Specialist at Mount Elison, relayed a similar experience: "… it was pretty daunting. I didn't know where to start. I didn't really know what to do" (Interview 1, February 12, 2018).

After they were made aware of technology accessibility policy, the LEAs decided to start addressing technology accessibility, specifically the accessibility of their websites, and in doing so began the first SLP stage of enactment. The LEAs that had received an OCR complaint had no choice but to respond to the legal action; they made

an immediate decision to begin addressing technology accessibility. LEAs that heard about legal actions from neighbors and friends, however, did not always move as quickly, delaying their transition to the next stage of the process. Though Gale and her colleagues had watched the OCR complaint "crusade" for a little while, it was not until the action moved closer to home that Mishawaka decided to start addressing technology accessibility.

In the smallest LEA in the sample, Keystone, one executive, Ben, made the decision to start addressing technology accessibility; he then relayed his decision to the Superintendent and the rest of the leadership team. In the four larger LEAs, a team of LEA leaders made the decision. At Broad Ridge, Mishawaka, and Milford Point, a handful of executive-level leaders were the primary stakeholders in the decision-making process. Mount Elison also took a team approach, but their decision-making team was a larger, existing, cross-organizational committee: "We have the ADA Advisory Committee, so we have conversations with kind of all of the people that are heads of the departments" (Rosie, Interview 2, July 25, 2018).

Strategizing, Learning, and Practicing Stage

After deciding to start addressing technology accessibility, LEAs transitioned into the first of many messy, compound stages of work comprised of strategizing, learning, and practicing (SLP). Over time, as the LEAs continued to enact technology accessibility policy and iterate their efforts, they progressed through several SLP stages. During each SLP stage, LEAs engaged organically with all three elements as the particulars of their context required. While these three elements of the work were apparent in all of the LEAs' processes, they did not unfold neatly and progression through the elements was

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not linear; each LEA engaged with the three elements in a unique and messy sequence in which lines of demarcation between the beginning of one element and the end of another were blurry at best. Overlaps between two and even three elements were often visible in an LEA's process, indicating that work in different elements occurred simultaneously and the work in one element often informed the work in another element.

Though the sequence of work in the SLP stages was messy, all of the work clearly fell into one of the three elements.

Strategizing. Broadly speaking, in the strategizing element, LEAs examined the larger picture of technology accessibility and made intentional decisions, both small and large, about how they would address technology accessibility. Strategizing comprised three components: putting out fires, developing plans, and creating policies. Most of the strategizing was deliberate work that progressed at a measured pace; however, during one component of the strategizing work—putting out fires—LEAs concentrated significant effort over a very abbreviated period in order to swiftly resolve a problem.

Putting out fires. All five of the LEAs felt that they had fires to put out, but the flames burned hotter in the two LEAs that received OCR complaints. Milford Point's and Broad Ridge's strategizing work began with putting out their respective fires; that is, figuring out how to respond to the letters they had received from OCR indicating a web accessibility complaint had been filed against them. Both LEAs brought in attorneys to help them develop a strategy for responding to the complaint: "We immediately engaged counsel, who had some experience working through these [complaints]" (Tom, Broad Ridge, Interview 2, July 11, 2018). Engaging attorneys was a common and logical first step to putting out the fire of an OCR complaint; the LEAs had to respond in writing to

OCR and attorneys helped the LEAs craft advantageous language and devise effective legal strategies. In fact, training materials distributed at Mishawaka advised LEAs that received OCR complaints to enlist their attorneys in assisting with this piece of the strategizing work: "the district should contact both the Office of Civil Rights (OCR) [*sic*] and the district's attorney" (*Accessibility Information for LEAs*, Artifact MK3).

At Broad Ridge, the fire-fighting strategy devised by Tom, Laura, the Superintendent, and the attorney involved remediating the handful of accessibility barriers identified in the complaint within a matter of weeks, demonstrating to OCR that the barriers had been fixed before OCR could begin its investigation. Broad Ridge's approach resulted in the complaint being dismissed, successfully extinguishing the flames. Tom described the strategy and its success: "The OCR letter only identified seven items… We were able, ultimately, to not get slapped with anything. We were able to correct all of the issues prior to anything else happening" (Broad Ridge, Interview 2, July 11, 2018).

Milford Point's strategy also involved collaborating with an attorney and taking swift action. In their response to OCR, Milford Point requested a resolution agreement to halt OCR's investigation, as noted in a 2016 letter: "… prior to the completion of OCR's investigation, the District asked to resolve this complaint pursuant to Section 302 of OCR's Case Processing Manual…. OCR determined that it is appropriate to resolve this complaint with an agreement" (*OCR Letter*, Artifact MP12). The LEA and OCR developed the Resolution Agreement through negotiations, which took place over a few months: "…from June until October, they had gone back and forth with lawyers and the OCR, and trying to come up with what would they need to do to even try and meet what

the OCR was requesting" (Anthony, Milford Point, Interview 1, February 1, 2018). The

attorneys helped the LEA craft and negotiate advantageous language for the Agreement.

For example, in the Resolution Agreement, while Milford Point agreed to engage in work

to improve the accessibility of their website, the LEA did not admit that they "…violated

Section 504 and Title II and those statutes' implementing regulations" (*OCR Resolution*

Agreement, Artifact MP11).

However, the LEAs that received OCR complaints were not the only ones that felt

like they had fires to put out. The threat of legal action was sufficient to send other LEAs

into fire-fighting mode too, albeit without the accompaniment of attorneys. At

Mishawaka, Gale closely watched the wave of legal activity move across Michigan, and

as it moved "closer to home," the LEA sprang into action. Keystone also began fighting

the fire when they saw and smelled the smoke from a few counties over. At Mount

Elison, a combination of legal activity and the January 2017 update to the Section 508

regulations made addressing technology accessibility feel urgent; Anika mentioned that

they had to update the LEA's website by a certain date, or they could be sued. Though

she was not explicit, the deadline she referenced was almost certainly the date by which

compliance with the updated Section 508 regulations was required; at the time of the

study, the Section 508 regulations were the only accessibility policy with current

compliance deadlines.

The LEAs that did not receive OCR complaints were able to quickly transition

from fire-fighting to developing a plan to address the accessibility of their websites, as

they did not have to devote time to negotiating with OCR. Unlike fire-fighting—a hectic

type of work where the LEAs devoted significant attention to solving a problem over a

very short period of time—developing a plan was more deliberate work that occurred over a longer period of time during which the LEAs' attention was often divided among various priorities.

Developing a plan. Developing a plan was another component of strategizing in which LEAs took different approaches; for example, the five LEAs' plans varied in their levels of formality. Of the participating LEAs, Milford Point had the most formal plan, which was referred to as a "corrective action strategy" in their OCR Resolution Agreement: "… the District will develop a corrective action strategy based on the audit findings that includes relevant timeframes for completion of the corrective action strategy" (*OCR Resolution Agreement*, Artifact MP11). Other LEAs took time to make decisions about how they would address technology accessibility and created informal plans for moving forward; these informal plans, however, were not documented in a cohesive artifact like Milford Point's corrective action strategy.

To develop their plans, LEAs made decisions about goals and benchmarks, timelines, who would be responsible, what approaches they would take, and what resources (i.e., staff time and money) would be allocated to these efforts. The larger question underlying many of these decisions was: How important is technology accessibility to our organization? Or, as Tom put it, "[w]hat's the value of this investment?" (Broad Ridge, Interview 2, July 11, 2018). Answering the underlying question, whether tacitly or explicitly, required LEAs to negotiate competing priorities and examine the alignment between technology accessibility and their organizational values. Superintendents often made the executive decisions associated with determining the value of technology accessibility as an investment for their LEA. Tom shared:

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That's an issue of alignment, and alignment really has to come from the highest

levels of the organization, so you fit this into your priority list by working through

what do we need to do? What are our goals? What are our strategies? What are

our priorities? And as you look at those priorities, you do have to make some

decisions, but those decisions really need to start at the beginning… then you can

begin working on, "Am I going to spend $30,000 on licensing a piece of software,

or am I going to buy new gymnastics bars, or wrestling mats, or" you name it.

That's when that, that's the way you reach that decision. I don't think you can do

it any other way… (Broad Ridge, Interview 2, July 11, 2018)

Gale echoed this sentiment:

Well I think it starts at the top and certainly our Superintendent embraces the idea

that students and customers ought to be able to have equal access. And so, you

know it's a priority topic for us. I mean, it's not always the most important topic

because there are day-to-day safety and security issues about students that rise to

the top… (Mishawaka, Interview 1, March 1, 2018)

Developing a plan and making all of the associated decisions often necessitated

gathering some baseline data about the accessibility of the LEAs' websites. For example,

to determine how they would approach bringing their website into compliance, Milford

Point asked Anthony to conduct an audit of their existing website and propose a course of

action.

… they asked me in October of 2016 to begin investigating especially the website.

From October 2016 through probably early February of 2017, I was going

through our 15,000 pages and trying to figure out which would be the more

beneficial course for us: to remediate what was out there or to take it all down and start from scratch. What I found was, we used to depend on PDF files for almost everything. So, I had almost 2,000 PDF files located on the district website.… As I'm going through trying to make them accessible, it was becoming more and more obvious that it just wasn't going to be workable. So, probably February of 2017, I took my findings to the executive I report to. We decided to take it to the board and rebuild the website from scratch. (Anthony, Milford Point, Interview 1, February 1, 2018)

Mount Elison also used internal resources to gather baseline data; the LEA asked their technology department to conduct a self-assessment: "So [web accessibility] was one area that we could very specifically say, 'Hey, IT people, can you go through this and just let us know. Are we compliant under these things?'" (Rosie, Interview 1, February 12, 2018).

Gathering baseline data, however, was not always a fruitful endeavor. At Keystone, Ben enlisted the services of a local accessibility consultant to conduct an audit and provide reports about each of Keystone's websites. The reports were each several hundred pages long and they relied heavily on data generated by an automated accessibility checker: "Category: Accessibility; Guideline: WCAG 2.0 A 2.1.1 Section 508 (2017) A 2.1.1; URL: /; Description: ONKEY handlers on static elements like DIV and SPAN cannot be triggered unless TABINDEX is set; Line(s): 3, 23, 36; Number of Occurrences: 3" (*Website Accessibility Evaluation*, Artifact KS1). Unfortunately, due to the reports' structure and language, Ben found them to be overwhelming and impractical.

The only useful information Keystone was able to glean from the reports was that the accessibility barriers were systemic.

The baseline data facilitated the LEAs' progression in developing their plans: negotiating competing priorities, developing an approach, and allocating resources (i.e., staff time and money). For example, as discussed above, Milford Point decided to overhaul their website as a result of the baseline data that Anthony gathered. Rebuilding a website is a costly endeavor, so the LEA needed to negotiate competing priorities to keep the overall budget for the website within acceptable parameters. To accommodate the cost of the site redesign and accessibility work, Milford Point decided to dramatically reduce the size of their website from 15,000 to just over 500 pages, and to remove some optional features, such as the app.

At Keystone, though Ben wasn't able to use all of the baseline data he received from the consultant, he deduced that the LEA's websites had numerous accessibility barriers and remediating them would require more time and expertise than he had to give. Consequently, Keystone's plan involved delegating some of the work to school webmasters as well as contracting with the web developer to conduct accessibility audits and remediate the identified accessibility barriers.

Given the differences in values, competing priorities, and contexts, the resource allocation for technology accessibility varied from one LEA to the next. Four of the LEAs allocated a significant portion of one person's time to the web accessibility effort (i.e., Anika at Mount Elison, Anthony at Milford Point, Ben at Keystone, and Laura at Broad Ridge); however, the allocation of additional staff time to assist them with the work differed across the LEAs. For example, at Mount Elison, Anika received substantial

mentoring and assistance from Rosie and Fred. At Broad Ridge, Keystone, and Milford Point, some of the responsibility for the accessibility of web content produced at individual schools was delegated to the school webmaster, principal, or secretary.

As with staff time, the allocation of financial resources also varied. Some of the LEAs found that determining the exact cost of the technology accessibility work was a challenging piece of developing a plan: "The overall [accessibility] project budget is difficult to estimate as it largely entails staff time… The $20,000 of requested funds will support the entirety of the defined initiative components" (*Accessibility Grant Application*, Artifact MK2). Conversely, at Milford Point, "[t]here was no budget" (Anthony, Milford Point, Interview 1, February 1, 2018); the LEA just took money from wherever it could to absorb the cost of bringing the website into compliance in accordance with its resolution agreement with OCR.

Creating policies. Though they took somewhat diverse approaches to crafting formal technology accessibility policies, all five LEAs engaged the highest levels of LEA leadership (i.e., the school board or executive team) in the policy development process and posted their policies on their websites. Two LEAs, Mishawaka and Broad Ridge, anticipated creating formal policies in the future, but did not feel knowledgeable enough to draft them when we spoke: "We want to make sure that we've found all the edges of it [accessibility] first, I think, before we commit something to a policy" (Gale, Mishawaka, Interview 1, March 1, 2018). For Mishawaka and Broad Ridge, understanding all aspects of accessibility as well as the types of policies other LEAs had developed was a necessary prerequisite to developing their own policies, an example of one place where the strategizing and learning elements of the process overlapped. The LEAs did not want

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to create a document prematurely and later come to regret a poorly conceived policy. At Broad Ridge, Tom and the technology department compiled a large binder of material about accessibility, which they shared with the executive team, to serve as background information for developing a policy. But the technology department had not yet synthesized the plethora of information into a policy recommendation to present to the executives.

The LEAs that had technology accessibility policies also engaged the highest levels of LEA leadership in their policy development process. In accordance with their OCR resolution agreement, Milford Point's policy development process involved several steps: They drafted their policy, sent it to OCR for approval, had the school board approve the policy, and subsequently posted it on their website. At Mount Elison, after the policy was drafted, the Director of Special Education presented the policy to the LEA's Policy Committee. Members of the committee then voted the policy up to the school board for a final decision. Once the policy had been approved by the school board, it was posted to the LEA's website.

The LEAs' policies varied in size from 200 to 650 words. However, all of the policies focused on web accessibility (as opposed to the accessibility of all technology), communicated a commitment to making the website accessible to disabled people, and provided a method for visitors to voice web accessibility concerns. Mount Elison and Milford Point's policies also identified the laws with which they intended to comply (i.e., Section 508 and the ADA) as well as the technical conformance standard they were using to measure web accessibility (i.e., WCAG). Mount Elison's policy also outlined some of the procedures, such as regular audits, the LEA would use to meet their goals.

Learning. Though both Broad Ridge and Mount Elison had employees with a little prior knowledge of technology accessibility, at the organizational level, all five LEAs were unfamiliar with the topic prior to the legal action that prompted their work, as evidenced by the lack of technology accessibility policy, practice, or discussion within the organizations. As a result, the LEAs were building their technology accessibility knowledge from scratch. To construct this knowledge, LEAs used a variety of avenues, including: (a) self-directed online research, (b) attending professional development workshops and conferences, (c) connecting with technology accessibility experts in their network, and (d) leveraging resources and services offered by vendors. Through these different avenues, LEAs developed knowledge around the "language" of technology accessibility, the technical aspects of accessibility, the legal basis for technology accessibility, and the impact that inaccessible technology has on disabled people. LEAs delegated the work of constructing this knowledge for the organization to individual employees or small groups of employees.

Learning avenues. Since they had limited prior knowledge, LEAs often began their journey with online research. Their approach to online research unsurprisingly began with "Google. I'm pretty much all Google…. Pretty self-taught" (Anika, Mount Elison, Interview 1, February 12, 2018). In their Google (actual name) searches, participants reported using keywords such as accessibility, compliance, and Department of Justice. These keywords returned thousands of results that participants sifted through to identify the resources that were appropriate for their current level of understanding: "So, I was going through and finding resources that sort of made sense at the knowledge level that I was at…" (Anthony, Milford Point, Interview 1, February 8, 2018). At the

same time, although participants often turned to Google first, the search engine did not always have the answers they were looking for: "There was one little thing that I couldn't figure out how to do and I was trying to find any answer on Google or something like that, and I just couldn't find an answer to it" (Anika, Mount Elison, Interview 1, February 12, 2018). When Google failed them, participants turned to other avenues to construct organizational knowledge about technology accessibility.

Professional development workshops were another popular avenue for constructing knowledge, particularly early in the journey. These professional development opportunities were hosted by local professional organizations, nonprofits, and, occasionally, the states. Multi-disciplinary instructional teams facilitated the workshops, which often included state department of education representatives, officials from federal agencies (e.g., OCR, Department of Justice), attorneys, educators, assistive technology specialists, and disabled people. LEAs sometimes sent small teams to the trainings, typically including an executive or two (i.e., CIO, Deputy Superintendent) as well as the person who was primarily responsible for the LEA's technology accessibility effort. Milford Point took this approach: "it was myself, my executive [Executive Director of Operations and Innovation], and… our communications director was there also" (Anthony, Milford Point, Interview 1, February 1, 2018). John, who worked for Access Ed, a nonprofit focused on making K-12 education accessible to all students, and who facilitated the trainings that Milford Point and Mishawaka attended, explained that the aim of the team approach was to develop deeper organizational knowledge: "… a group of people from your school that are coming to the training… because we only pick

up so much when we're face-to-face, but hopefully if I get this and you get that, we can work together…" (Interview 1, July 12, 2018).

As LEAs gained knowledge and connections within the field of technology accessibility, other avenues for constructing knowledge became available: LEAs reached out to technology accessibility experts with whom they had developed relationships, colleagues in other LEAs who were working on technology accessibility, and their own web vendors. Fred and Rosie emphasized the important role that experts played in the learning process at Mount Elison: "State Assistive Technology Organization has been a tremendous help. If they don't know the answer, they find somebody [who knows] the answer" (Fred, Mount Elison, Interview 1, February 12, 2018). Rosie added, "We have some free resources through Regional ADA Center, in terms of our website accessibility…. it's hugely important, because without that kind of guidance, people wouldn't know what to do" (Interview 1, February 12, 2018). LEAs that came to the trainings that John facilitated were added to a listserv, which they frequently probed for information and guidance, especially on technical topics, such as how to properly format charts or how to tag a complex PDF.

LEAs also leveraged the resources and expertise offered by their web vendors. For example, Broad Ridge's web development platform provided a prominent link to resources about creating accessible web content, which Laura found to be very helpful. The resources were so helpful that she later shared them during a web accessibility training she conducted for school webmasters, an example of how the learning element informed the practicing element of the SLP stage of enactment. Some LEAs had access to live customer support through their web vendors, which they often leveraged as they tried

to figure out how to implement an accessibility feature, as Anika shares in the following paragraph.

Though LEAs may have learned about an accessibility feature through online resources, they still had to learn how to apply that knowledge to their websites, and that required hands-on practice. Transitioning from reading about a feature to actually implementing the feature was intimidating for some because the work often required editing HTML code, which was new for many of the participants who did not have a technical background (a topic that will be discussed at length later in this chapter). At this point, participants often reached out to their web vendor's customer support as a way to scaffold their learning as they implemented the accessibility feature, an example of the co-occurrence of learning and practicing. Anika discussed how she used her web vendor's customer support as she implemented accessibility features: "They have a really awesome chat function, which I really like. I've used from anything like, 'Hey, can we work through this step-by-step because I want to make sure I don't mess something up'…" (Mount Elison, Interview 1, February 12, 2018).

Knowledge developed. Through self-directed online research, professional development workshops, conversations with experts in their networks, and vendor resources, LEAs developed knowledge around the technical aspects of accessibility, the legal aspects of technology accessibility, and the impact that inaccessible technology has on disabled people. In order to construct this knowledge, however, LEAs had to first learn the "language" of technology accessibility; as Gale explained, "it's like looking at a whole new language and trying to figure out what it's telling you and trying to figure out then how to fix it. So it's a time-intensive thing…" (Mishawaka, Interview 1, March 1,

2018). Laura and Anika both underscored Gale's assessment of the time-intensive nature of learning the language: "I really don't want to spend time on [reading this resource] because it's taking too much work you know to understand it and go through it" (Laura, Broad Ridge, Interview 1, February 16, 2018). Not being fluent in the language of technology accessibility was a particularly frustrating barrier during self-directed online research; many of the resources were full of jargon that rendered them incomprehensible to the LEAs: "There's times when I read it, I'm like, 'OK, so that tells me how to fix it, but I don't know what that means'" (Anika, Mount Elison, Interview 1, February 12, 2018). LEA employees wished for more resources written with lay readers in mind so that they could begin learning at a comfortable pace, rather than being forced to learn about technology accessibility through full immersion in the technical language, which they found incredibly overwhelming.

Technical knowledge. Once LEAs gained emerging knowledge of the language of technology accessibility, they could begin to understand the technical aspects of accessibility, which were required to remediate accessibility barriers and begin creating accessible content. In developing this technical knowledge, LEAs spent most of their time learning about the common features of digital content and interfaces that can create barriers for disabled people, but they also learned about stand-alone accessibility tools and software features that can help create accessible content or remediate accessibility barriers.

In learning about the characteristics of inaccessible digital content and interfaces, which can pose barriers for disabled people, LEAs developed the most knowledge about characteristics that fall under two of the four WCAG principles, perceivable and

operable. This focus was due to the pervasiveness of barriers in these categories on the

LEAs' websites. The guidelines that fall under the perceivable principle of WCAG ensure

that everyone, including disabled people, can discern the outputs of a digital interface

(e.g., digital content that only provides visual output is inaccessible to blind people, and

digital content that only provides auditory output is inaccessible to Deaf people;

Kirkpatrick, Connor, Campbell, & Cooper, 2018). Similarly, the guidelines that fall under

the operable principle of WCAG ensure that everyone, including disabled people, can

manipulate a digital interface (e.g., disabled people who use an alternative input device

such as a keyboard or switch can still input data and maneuver around the interface;

Kirkpatrick et al., 2018).

Under the perceivable principle, LEA employees developed knowledge about

alternative text, contrast ratios, fonts, image PDFs, and tables. Under the operable

principle, LEAs developed an understanding of keyboard access, meaningful hyperlinks,

and semantic structure (e.g., headings). For example, at a professional development

workshop, Ben developed basic technical knowledge around ensuring digital interfaces

are both perceivable and operable:

> Well, they covered things like alt tags. They covered things like color contrast.
> They covered font, different things, just things for someone who is visually
> impaired or hearing impaired or—The big thing was: are your dropdown menus,
> will they activate with a mouse and a keyboard, because some people can
> manipulate a keyboard better than they can a mouse. (Ben, Keystone, Interview 2,
> July 20, 2018)

Training material circulated at Mishawaka highlighted the importance of meaningful links, one of the basic components of the operable principle: "Avoid the use of the term 'Click Here' as it is redundant, not unique and if used multiple times on the page, it is certainly not meaningful. The hyperlink needs to reference and describe what you are linking to.…" (*Accessibility Information for LEAs*, Artifact MK 3). Employees at Milford Point and Mishawaka had the opportunity to develop knowledge beyond the most basic components of perceivable and operable (e.g., alt text, color contrast, meaningful links) during the workshop they attended. John, who facilitated the workshop, shared some of the more intermediate topics that he covered, such as "…the reading order of that document, or let's talk about defining the scope and nature of the table that you're working with…" (Access Ed, Interview 1, July 12, 2018).

LEAs also learned about stand-alone accessibility tools and software features, which help them create accessible content and remediate accessibility barriers. These tools include automated accessibility evaluation tools (i.e., WAVE, Grackle Docs, Adobe Acrobat; actual names), YouTube's closed captioning tool, and office software features (i.e., styles). For example, Laura described in detail what she learned about one automated accessibility evaluation tool:

> There's actually an extension that you can put into your browser so that all you have to do if you're on a page you click on the extension and it will look at the page for you. Yeah, it's called Wave.webaim.org [actual name]… And so the main page that comes up you can put in your URL and click go or the arrow and on the left hand side it has a menu showing you all the different errors and issues that it finds on your page and then it shows your page and has little icons to show you

where you need to make changes…. It's telling me I have a header 2 HTML tag

that doesn't point to anything it's just sitting there. So I have an empty tag. And so

what they want you to do is go in there and clean that out because the [screen]

reader is going to go there and not be able to identify what it is for the person

who's using it. (Laura, Broad Ridge, Interview 1, February 16, 2018)

The training materials also provide evidence of what the LEA employees learned. For

example, here is how to use the features of common office software to create accessible

documents, according to the training document:

Use Styles to organize your document. Styles divide your document into sections,

making it easier for people to jump to a section (especially if they're using

keyboard shortcuts)…. Include alternative text for images, drawings, and other

graphics. Otherwise, screen reader users just hear 'image.' (*A11y 101 Training

Slides*, Artifact ME2)

In digging into the technical aspects of accessibility, LEA employees developed

an understanding of the features of digital content and interfaces that can pose barriers to

disabled people. They also learned how to use different tools and software features to

create accessible content or remediate accessibility barriers. While LEAs were

developing their understanding of the technical aspects of accessibility, they were often

concurrently, or in quick succession, learning about the legal aspects of technology

accessibility. The two topics are very closely related, particularly around the technology

accessibility standards, which are codified in federal regulations.

Legal knowledge. While LEA employees learned about the technical aspects of

accessibility through several avenues, they primarily learned about the legal aspects

through professional development workshops or technology accessibility resources that were specifically developed for K-12 schools, such as the *Getting Started with Accessibility* guide that served as a key learning resource for Broad Ridge and many other LEAs around the country. LEAs did not attempt to understand the legal aspects of technology accessibility through self-directed online research; in fact, overall, LEAs spent far less time learning about the legal aspects of technology accessibility than they did learning about the technical aspects. When the legal aspects were discussed at the professional development workshops, they were often covered during the first half of the training, serving as background information for the technical material that was covered later in the workshop. For example, a session called "Digital Accessibility-Legal backdrop," (*Seminar Agenda*, Artifact MK1) immediately followed the welcome at the training session Mishawaka hosted for LEAs in their region. Representatives from federal agencies or local attorneys specializing in disability rights law often covered the legal aspects at the workshops; Gale mentioned having both local attorneys and OCR employees present at their summit, and Anthony recalled representatives from the Department of Justice presenting at a workshop he attended.

Through the trainings and targeted resources, LEAs developed some knowledge about the laws from which the technology accessibility requirement arose and how those laws applied to K-12 schools. The *Getting Started with Accessibility* guide provides an example of how this information was presented:

> Although the laws related to individuals with disabilities did not explicitly address accessibility issues, such as the Rehabilitation Act (1973), and the Americans with Disabilities Act (ADA; 1990, amended 2008), case law and guidance from the

U.S. Department of Justice and the U.S Department of Education indicate that websites and website content fall under the umbrella of existing nondiscrimination laws…. the DOJ and ED clarified that this ruling applied to both K–12 and higher education. (*Getting Started with Accessibility*, Artifact BR3)

In addition to the legal basis and precedence for technology accessibility, trainings and resources also touched at least briefly upon the fact that LEAs should endeavor to meet the technology accessibility standard set forth in the Section 508 regulations, which as of 2017 incorporated WCAG by reference. For example, at the Access Ed training, which Milford Point and Mishawaka both attended, the following information was shared:

We need to know the standards that we're trying to meet. What Are the Standards? (1 of 6) Section 508 of the Rehabilitation Act (updated in January 2017) "The Revised 508 Standards specify that all types of public-facing content, as well as nine categories of non-public facing content that communicate agency official business, have to be accessible, with 'content' encompassing all forms of electronic information and data."… "… shall conform to Level A and Level AA Success Criteria and Conformance Requirements in WCAG 2.0." (*Access Ed Handout*, Artifact AE1)

Though LEAs learned about some of the specific components of the legal requirements for technology accessibility from trainings and resources, they did not spend a great deal of time developing in-depth knowledge about the laws. Consequently, the knowledge that persisted as they progressed through the enactment process was a general sense that the law requires K-12 schools to use accessible technology. Numerous

participants indicated that they knew their school was required to have an accessible website, but they admitted they didn't know the specifics: "I know that part of my job description is to make sure that things are as accessible. I don't know past that point. I know that my boss looks into it [laws] occasionally…" (Anika, Mount Elison, Interview 1, February 12, 2018). John observed the same surface knowledge about the law in the dozens of LEAs around the state of Michigan with whom he worked, "[s]o a lot of them didn't, you know, they know, 'Well, there's a law out there that we have to abide by, we don't know what it is'" (Access Ed, Interview 1, July 12, 2018).

Impact of inaccessible technology. It was apparent to LEAs early on that they needed to develop knowledge about the technical and legal aspects of technology accessibility. Along the way, in their quest for technical and legal knowledge, LEAs also gained an understanding of the impact that inaccessible technology has on disabled people. This incidental learning ended up playing a critical role in the evolution of the LEAs' purpose for enacting technology accessibility, a topic discussed at length in part 3. Participants learned about the impact of inaccessible technology by observing disabled people, often blind people, interacting with inaccessible technologies. Opportunities to observe and learn from disabled people occurred at professional development workshops and within the LEAs. At Mount Elison and Broad Ridge, employees learned by observing their disabled students struggle with inaccessible technologies. The trainings that Milford Point, Mishawaka, and Keystone attended featured presentations by blind people who talked about and demonstrated the barriers they confront when technology is inaccessible.

Gale described a presentation in which her team:

> … actually even had a student who had an impairment come and demonstrate for
>
> the group... why it was challenging for them to use a website. So we actually got
>
> very specific about, you know, from the learners' perspective or from the person
>
> accessing a system, what does it feel like…. you know, looking back at the
>
> feedback on it, that was probably the part that made some believers out of people
>
> who really felt like this was just going to be an onerous task to try to do without
>
> really connecting to the reason why. I think it gave them the why. (Mishawaka,
>
> Interview 1, March 1, 2018)

The experience struck a chord with Sarah, as well. She described how "watching and listening to what she [the student] goes through just to research and find and pull together the information she needs to complete her work was really eye-opening… I can't imagine… how that must hamper her learning" (Mishawaka, Interview 1, March 1, 2018).

From these direct interactions with disabled people, LEAs learned why technology accessibility matters, not just because it is a legal requirement, but because it impacts other people's lives: "Look, number two, it's the law. It is a compliance issue, but more important than that it's the right thing to do" (Ben, Keystone, Interview 2, July 20, 2018). Anika indicated that her work on the Mount Elison website was guided by her understanding of the impact that inaccessible technology has on disabled people:

> … if it helps somebody read it or makes it a little bit easier for them to read it,
>
> then I'll spend five minutes and do it, just to make sure that it's taken care of… if
>
> I can make it easier for at least one person, I am doing my job and I am hoping

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that I am making it easier for a lot more than just one person. (Interview 1,

February 12, 2018)

As a result of their limited prior awareness, LEAs often had to build their

technology accessibility knowledge from scratch. The new knowledge they developed

ranged from the language of technology accessibility to an understanding of how

inaccessible technology impacts disabled people.

Practicing. In order to put technology accessibility into practice, LEAs first had

to have some type of strategy, no matter how informal, and their employees had to have

at least a basic level of knowledge. Consequently, the learning and strategizing work

often preceded and informed LEAs' technology accessibility practice. LEAs did not,

however, spend extended periods of time exclusively strategizing or learning. Once they

had an informal strategy and/or a basic level of knowledge, LEAs began putting

technology accessibility into practice while they continued to refine their strategy and

deepen their knowledge. To put technology accessibility into practice, LEAs applied the

knowledge they were continuing to build and carried out the strategies they were still

honing. Practicing technology accessibility comprised four activities: technical

implementation, tracking progress towards the LEAs' goals, communicating LEA policy,

and building technology accessibility capacity within the LEA.

Technical implementation. During the strategizing element, LEAs chose different

approaches to ensure their websites were accessible, and the approach each one chose

impacted the nature of their technical implementation work. While technical

implementation at all five LEAs encompassed both remediation and accessible content

creation, the two LEAs that chose to undertake a significant overhaul of their websites

had to create more accessible content, whereas the three LEAs who chose to keep their existing websites had to remediate significantly more existing content.

Creating accessible content. The two LEAs that chose to overhaul their websites worked closely with their website vendors to design their new sites to be accessible from the start. The LEAs were responsible for determining the organization, content, and aesthetic of the sites, and the vendors were responsible for creating the templates and developing the necessary code to bring the LEAs' ideas to fruition. Anthony described his close work with Milford Point's website vendor:

> K12 Web is our web provider, so they built the shell of our website. I put together the plans of how I wanted our new website to work. So, the tree of the website, exactly how it should look… from the choosing of the colors to the fonts that we used on certain pages. As I created everything, I then submitted it to K12 Web, who went through and did an offline design to try to meet what I was looking for... Once K12 Web was done with the shell and we had approval from our [school] board, essentially, I had to take everything. K12 Web was done… Everything that they put together was created with accessibility from the ground up. (Interview 1, February 1, 2018)

Like Milford Point, Mishawaka worked closely with their web vendor to redesign their site. Before beginning the redesign, the LEA made the vendor guarantee the new site would be accessible, a promise they outlined in the contract language.

Though Keystone, Broad Ridge, and Mount Elison did not choose to overhaul their websites, they too created new content for their websites on a regular basis and needed to ensure it was accessible. Ben described how he applied his new knowledge

about the importance of meaningful links by creating accessible hyperlinks when he uploaded new content:

> Something I used to do is, I'd put "Click here to do this," well, "here" doesn't tell anybody anything. So like if we have put out a link, like our Superintendent writes, it's called "Insight on Education." So on our webpage, I will put, "Insight on Education March," and that will be the hyperlink. (Keystone, Interview 1, February 26, 2018)

Similarly, at Mount Elison, Anika discussed applying her knowledge of alt text when she posted weekly news stories to the website, ensuring all the images were described with alt text.

As they created new accessible content, LEAs encountered some challenges that required them to develop more knowledge. This is an example of the movement between and co-occurrence of the practicing and learning elements of the process. For example, Tom noted that as Broad Ridge worked on accessible content creation by ensuring images had alt tags, they, like Mount Elison, had no trouble with simple informational images. But they found that the LEA did not have the requisite knowledge to write appropriate image descriptions for complex instructional images: "… this drawing of the forces that make an airplane fly: drag, thrust, gravity, and lift. How those four forces play on that airplane. If all you say is, 'picture of airplane' the student doesn't have any access..." (Tom, Broad Ridge, Interview 1, February 9, 2018). When we spoke, Broad Ridge was in the process of reaching out to technology accessibility experts, such as Bookshare (actual name), to help them develop the knowledge they needed to effectively add alt text to instructional images. John shared that the LEAs with whom he worked frequently asked

the Access Ed listserv about various technical aspects of creating accessible content, such as how to make an accessible table. Here, the LEAs made a quick transition back into learning so that they could continue creating accessible content, while they simultaneously continued to put other components of technology accessibility into practice.

Four of the LEAs used webpage templates that were designed to be accessible, which made it easier for LEA employees to create accessible content. The templates provided an accessible page structure, so all the employees had to do was add their content. In addition to providing an accessible structure from which to start, the templates also constrained web content creators, effectively preventing them from posting inaccessible content. For example, the template might prescribe the fonts and colors used on a page, or require that images have alt text. Vivian, Coordinator of Operational Systems at Broad Ridge and a member of the Technology Department, explained, "[t]hey're doing that using a template at the district level, which still allows the schools to individualize for their needs, but will hold them true to certain pieces" (Interview 1, February 8, 2018). Mishawaka also used templates as a fail-safe; Sarah explained, "[w]e don't really have to worry… we have everything in terms of the CMS [templates]. We, they [content creators] aren't going to have the choice to use text that isn't going to be, have the right contrast to meet requirements" (Mishawaka, Interview 1, March 1, 2018).

In addition to helping LEAs create accessible content, the templates also streamlined some remediation tasks: "We use a common template so that helps, when we fix the template everybody is fixed" (Tom, Broad Ridge, Interview 1, February 9, 2018). So, for example, if the heading order of a template was incorrect or if a heading did not

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have an appropriate heading tag, two important aspects of semantic structure for accessible websites, the LEA could go in and fix the code for the template. Once the code was updated, all pages that used that template would be updated and all of the associated accessibility errors would be remediated.

Remediating accessibility barriers. In addition to ensuring new web content was accessible, all five LEAs needed to remediate some accessibility barriers. Even Milford Point and Mishawaka, which both chose to fully redesign their sites, still had to port over some of their old content, and that content required remediation in order to meet the LEAs' new accessibility standards. Remediating accessibility barriers was an extensive and time-consuming task: "just the breadth of what it entails, because it's taken decades to build sites and just the plethora of information... when you think about having to go through every single document posted and figure out, or make it accessible…" (Sarah, Mishawaka, Interview 1, March 1, 2018)

At Milford Point, Anthony was responsible for both the breadth and depth of the remediation work that Sarah described. In an update he gave to the Milford Point Board of Education, he described the extensive remediation work that his one-man Accessibility Department accomplished in a single quarter:

> Since January 2017, the Accessibility Department has been working diligently to bring the District's website into alignment with our goal of accessibility for all users. To that end, the following items have been accomplished: 615 PDF files that did not meet accessibility guidelines have been corrected, with 535 more to be corrected… 40% "AA" accessibility issues on our current website have been corrected… (*Q1 Board Update*, Artifact MP4)

In fact, many of the LEAs used PDFs extensively on their websites, and those PDFs were often inaccessible for one of two reasons: (a) because the PDF was an image of a scanned document, and thus was not even machine readable, or (b) because the PDF was not properly tagged (i.e., it didn't have headings or alt text). Consequently, a great deal of the LEAs' remediation work centered on PDFs. Anika described spending "like three weeks updating PDFs for accessibility" (Mount Elison, Interview 1, February 12, 2018). LEAs used Adobe Acrobat to remediate inaccessible PDFs, a process that Milford Point and Mishawaka learned about at the Access Ed workshop and other LEAs learned through self-directed online research. Anika, who taught herself how to remediate PDFs, described the process:

> [Adobe] has an accessibility checker tool, which is really awesome for somebody like me who doesn't necessarily know what they are doing…. I would download the PDF, open it in Adobe kind of tag everything…. Then [Adobe] would let you do a full check, which might show that… "Your headings aren't lined up right." "You have an H1 heading and then an H3 heading." "Your language isn't set." (Anika, Mount Elison, Interview 1, February 12, 2018)

Remediation work was tedious, time-consuming, and often overwhelming. This aspect of practicing was informed by baseline data collected earlier as part of strategizing. When reviewing the aggregated baseline data, participants were overwhelmed by the breadth and depth of the problems. Participants described feeling unsure about how they would ever finish all the work, particularly since they did not feel like they had a good handle on technology accessibility in the first place. To combat some of the feelings of overwhelm, participants often started by remediating the easiest

accessibility errors, such as adding alt text, renaming "click here" links, and fixing color-contrast issues.

Once they took care of the easy fixes, the LEAs started working on the more complex barriers, work that sometimes required staff to develop additional knowledge, requiring a quick transition back to learning. For example, Anika ran into an accessibility barrier in some of the PDFs that she did not know how to fix. She searched online for answers, but had no luck. Eventually, her colleague Rosie, who was very well connected in the disability and accessibility world, put Anika in touch with a local technology accessibility expert who showed her how to resolve the issue. With that knowledge, Anika was able to go back and finish remediating all of the PDFs with that particular barrier.

Tracking progress. As LEAs engaged in the technical implementation of accessibility, they often simultaneously tracked their progress toward the goals they had identified for themselves while strategizing. For example, as discussed earlier, Anthony provided regular updates to the Board of Education regarding the progress of the technology accessibility work. All but one LEA tracked the progress of their technology accessibility efforts by conducting regular web accessibility audits. At the fifth LEA, Broad Ridge, staff were considering integrating auditing into their practice, but had not yet done so at the time of this study. The Resolution Agreement between OCR and Milford Point outlined the accessibility audit process: "…information provided by the District through its online content is measured against the technical standard(s) adopted in the Web Accessibility Policy. All problems identified through the Audit will be documented, evaluated, and, if necessary, remediated…" (*OCR Resolution Agreement*,

Artifact MP11). The procedures outline by OCR mimic those used by all four LEAs that engaged in regular audits.

The LEAs that performed regular accessibility audits primarily did so with the assistance of an automated accessibility evaluation tool, a subscription-based web app. These tools, which crawled the LEAs' websites, provided information in both auto-generated email reports and in a dashboard interface. In both formats, LEAs could quickly see which accessibility barriers existed on their sites and how pervasive the issues were: "Here's an issue that affects 562 of your pages" (Anthony, Milford Point, Interview 1, February 8, 2018). The tool that Mount Elison and Milford Point used also provided an accessibility report card, which Anika used as a way to gauge Mount Elison's progress, particularly compared to other K-12 schools: "This is our accessibility score; so we are at 83.3% and the industry benchmark is 68.8%, so it's not as high as I would want it to be. It would be awesome if I could get it to 100%" (Interview 1, February 12, 2018).

In addition to helping LEAs track their progress, the information from the audits also informed the remediation work. Anika described how she was able to use this information to inform her remediation work, including finding a place to start and determining what more she needed to learn in order to bring the website up to the standard the LEA had identified:

Accessibility Boost started off with a big chart and then it shows you there's different levels of issues, so there's "A," there's "AA," there's "AAA." Our issues were pretty high…. I just kind of started diving down when I first got into it and I was like, "OK. We'll just start with the first one. No big deal." I clicked on the

first one and I was like, "I don't even know what that means. I have no idea what an ARIA label is and all this other stuff." It was more, like I said, finding the things that I could take care of. "OK. Well, I could add alt text to this," or, "Yeah, I can totally change the color of that font"… Then you actually start seeing that progress and you are like, "Oh, this isn't that bad. OK, maybe I'll try and tackle one of those harder ones." For me, it was just trying to find a good starting point. (Anika, Mount Elison, Interview 1, February 12, 2018)

Anika's process showcases the interplay between learning and practicing. As an accessibility novice, she first had to find accessibility barriers that she knew how to fix. As she remediated those issues, putting her limited knowledge into practice, she gained confidence as well as some additional knowledge about technology accessibility. With her growing confidence, she felt comfortable tackling more difficult accessibility barriers, which required her to develop an even deeper understanding of technology accessibility. Eventually, she would feel confident enough to tackle that first accessibility barrier on the Accessibility Boost list, ARIA labels, which sounded very foreign and complicated when she first saw it flagged as an issue.

Unlike Milford Point and Mount Elison, which purchased a tool to help them conduct their own audits, Keystone opted to contract with a third party to conduct regular audits. Ben found that the regular reports were helpful because, among other things, the regular nudges kept web accessibility at the top of his mind, among the myriad other LEA priorities he dealt with from week to week. Though they had considered purchasing a subscription to Accessibility Boost, when we spoke, Broad Ridge did not have a formal mechanism for tracking their progress and instead, according to Tom, relied on the

quantity of complaints they received to know if they were meeting their accessibility

goals:

> I think the only way you can know that you've accomplished what you want to
>
> accomplish is you don't have someone saying, "I need help with this material in
>
> one way or another or this material isn't working."… I don't know that we have a
>
> barometer or a thermometer that says, "Oh, you're only at 10 degrees on this scale
>
> and not 100." (Broad Ridge, Interview 1, February 9, 2018)

On the other hand, Laura, who was involved in more of the details around the web

accessibility work at Broad Ridge, indicated that she used WAVE, a free automated

accessibility evaluation tool, from time to time to check the accessibility of specific

pages. Broad Ridge could have used WAVE to manually check the accessibility of all of

their individual pages, but that would have been incredibly time intensive given the size

of the website and the limitations of the free tool. Laura hoped that Tom and the other

executives would find a way to fit the cost of Accessibility Boost into the technology

department's budget, as she felt it would add a great deal of value. But as participants at

both Mount Elison and Mishawaka pointed out, Accessibility Boost is a very expensive

tool.

The information that LEAs gathered by tracking their progress also served to

inform their policy communication; namely, it indicated where they needed additional

communication with their content creators and editors. The regular accessibility audits

constantly compared the LEAs' websites against the identified accessibility standards.

Consequently, as inaccessible content was uploaded to the websites, it was immediately

identified by the audit tool and brought to the attention of the LEA: "I have an audit

running essentially continuously, so that when something's put out there, I get a notice… If it hits multiple errors through there, I know [the content creator has] not run through the checklist" (Anthony, Milford Point, Interview 1, February 1, 2018). When the audits caught accessibility barriers in new web content, the LEAs deduced that the content creators were not following the accessibility policy, which outlined procedures to ensure accessibility. Discoveries of deviation from the LEA's policy were often followed by policy communications of some kind.

Communicating policy. As discussed earlier, LEAs developed formal technology accessibility policies during the strategizing element of the SLP stage of work. LEAs then communicated these formal policies to both external and internal stakeholders.

Communicating with external stakeholders. OCR viewed communicating the formal technology accessibility policy with external stakeholders as an important component of the enactment process, as evidenced by the contents of its resolution agreements: "… the District will post the Web Accessibility Policy in a readily identifiable location on its website and will provide notification to students, prospective students, employees, guests, and visitors" (*OCR Resolution Agreement*, Artifact MP11). Mount Elison and Keystone, which, like Milford Point, had formal technology accessibility policies, were not required by a resolution agreement to post their policies online, but they too used their websites to communicate their policies with external stakeholders.

In addition to posting their policies on their websites, Mount Elison and Milford Point identified other avenues for communicating their technology accessibility policies and progress with external stakeholders. Mount Elison published a "news story" on their

website that provided an update on the LEA's technology accessibility work for external stakeholders. The story, which featured a picture of one of the LEA's blind students using a refreshable Braille display (assistive technology) and an iPad to navigate a website, read, in part:

> Mount Elison strives to communicate effectively with all members of the community. To ensure that the District and all school and program websites are accessible to everyone, Mount Elison has implemented a new accessibility monitoring system.… The implementation of this new tool stems from the District's efforts to make information readily available to all, and the requirements of Section 508 of the Rehabilitation Act… (*Website News Story*, Artifact ME9)

Similarly, Milford Point broadcast its policy and progress to a broader external audience through the *Superintendent's Summer Editorial* in the local newspaper:

> Our district is leading the way in the state in making enhancements to our digital media to ensure we provide Interactive Accessibility [*sic*] in accordance with the Americans with Disabilities Act and Office for Civil Rights Standards… we want to be sure that our digital media reflects our commitment to making public education accessible to all of our citizens. (Artifact MP10)

> *Communicating with internal stakeholders.* Communicating policy with internal stakeholders, namely employees, was also a significant component of the LEAs' enactment process. LEAs communicated their formal technology accessibility policies using a variety of approaches, which were selected based on the audience size and composition and the purpose of the communication. For example, LEAs had to

disseminate some policy messages, such as their accessibility policy, to their entire staff; Sarah shared one all-staff communication from Mishawaka's plan: "… once we have our new site there will be communication to all staff that they may not link to anything that is not accessible" (Interview 1, March 1, 2018). Other very specific messages only needed to be shared with one or two employees. The approaches that LEAs used, listed from broadest to narrowest audiences, included: their websites, formal meetings, trainings, policy resources (i.e., documents), and one-on-one communication.

Posting the technology accessibility policy on the LEAs' websites raised awareness among internal stakeholders as well as external stakeholders. The websites were effective tools for communicating with large audiences; however, to be appropriate and understandable for a diverse internal and external audience, the message had to be fairly broad. Consequently, posting on the website was only the first of many policy communications with internal stakeholders.

In formal meetings, each LEA's technology accessibility lead (i.e., the person who was ultimately responsible for the work and for enforcing the policy) shared the organization's technology accessibility policy with their colleagues both to make others aware of the new policy and to garner support. The success of this approach often rested on the way the message was communicated, as well as the political capital of the messenger. For example, Rosie, who had held a leadership role in Special Education at Mount Elison for many years, was comfortable being very direct in her communication with her colleagues: "You have to be OK with saying, 'Well, you know, it really is a requirement. And we really can't just kind of wink at this. We have to address it.'… We need you to be on board with this" (Interview 1, February 12, 2018). As a result of

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Rosie's direct communication style and her political capital, she confronted less overt resistance to her message.

At formal meetings, Anthony also raised awareness about the LEA's policy and sought support from his colleagues. However, he was new to his "middle manager" role, as he called it, and had neither the political capital nor the comfort and confidence that come with years of experience communicating LEA policy. Consequently, Anthony was more reserved when he made his policy pitch, and he was initially less successful at garnering support:

> I had my first meeting with the secretaries back in August of 2017, I had 20 secretaries in a small room with me. Twenty minutes into the meeting, I wasn't sure if I was going to get out of there alive or not. After an hour or so, yes, most of them had calmed down and we were able to get down to the nitty-gritty of how are we going to implement this, but, at one point, I was afraid for my life.
> (Milford Point, Interview 1, February 1, 2018)

Discussing technology accessibility at formal meetings was often the first targeted step LEAs took to raise awareness and garner support for the policy among key internal stakeholders (e.g., department heads, the individuals who would be responsible for some of the work).

In addition to formal meetings, technology accessibility trainings also served to raise awareness and garner support from larger groups of internal stakeholders. One technique to garner support, which LEAs used during trainings, was to explain the purpose and motivation for the policy. To that end, Milford Point hosted a training aptly titled *Why Accessibility Matters*. All five of the LEAs conducted training for internal

stakeholders as part of their enactment process. These trainings, in addition to communicating the LEAs' technology accessibility policies, also served to build capacity within each LEA, which will be discussed in detail in the next subsection.

Once the internal stakeholders were aware of the policy and the initial support for the policy had been garnered, each LEA used policy resources and one-on-one communication to continue to shape their employees' policy enactment. The policy resources ranged in format from materials developed by a third party to LEA-developed checklists and procedure documents. For example, a document that outlined procedures for digital content editors and creators to follow said, in part: "**NOTE : USE ONLY TAHOMA FONT SIZE 3 FOR ALL TEXT ON WEBSITE.**… **NOTE : BEFORE A DOCUMENT CAN BE UPLOADED, IT MUST HAVE GONE THROUGH THE ACCESSIBILITY CHECK USING OUR DOCUMENT at [URL] ** (*Instructions for Content Editors*, Artifact MP7, emphasis in original). Instead of creating their own resource, Mount Elison circulated a resource developed by a third party that outlined the best practices adopted by the LEA. In addition to outlining the steps to ensure accessibility, the resource offered links to additional information. These policy resources further delineated the LEAs' policy expectations and conceptions of accessibility. The documents were distributed to employees as a way to continue to shape their enactment of the policy by outlining actionable steps they were expected to follow.

In addition to policy resources, LEAs used one-on-one communication to shape the enactment of their technology accessibility policies. At most LEAs, this one-on-one communication took the form of casual reminders; at Milford Point, it took the form of formal structured reminders. Rosie explained why reminders were important:

"Sometimes it takes a little reminding, because that's [accessibility] not on the front of their radar" (Mount Elison, Interview 1, February 12, 2018). Rosie's colleague Anika, who made it her personal mission to abolish the use of "click here links," also used reminders to shape her colleagues' actions: "I have had multiple conversations, even with people in my department saying, 'Hey, 'click here' is a no go. Just don't use that anymore'" (Mount Elison, Interview 1, February 12, 2018). Casual reminders were an important component of the enactment process because everyone was very busy, a refrain echoed by participants across all five LEAs. Technology accessibility was not a priority for employees who did not work with disabled people on a daily basis, for three key reasons: (a) They did not see the impact of inaccessible technology on a regular basis, (b) they had not yet integrated technology accessibility into their daily practice, and (c) they were already overtasked and it was easy to forget about the new technology accessibility work among the myriad other priorities. As Rosie explained earlier, the reminders served to bring technology accessibility back to the front of people's minds and to help them begin to integrate it into their daily practice.

For the most part, participants felt that their colleagues who did not follow their LEA's technology accessibility policy did so for a combination of the three aforementioned reasons. Intentional disregard for the technology accessibility policy was only mentioned at Milford Point. Anthony explained that the employees who intentionally disregarded the policy did so either because they felt technology accessibility was too much extra work or because they were emphatically resistant to change.

Since Milford Point had some employees that the LEA leadership felt were intentionally disregarding the policy, and given that Milford Point had to comply with the OCR Resolution Agreement, they took a more formal approach to reminders. The LEA created a series of structured, tiered reminders to shape the enactment of employees who were not enacting the technology accessibility policy in a way that met the LEA's expectations. Anthony knew an employee or department was not following the policy outlined in the resources he had created and distributed when his audits identified new content that contained several accessibility errors. If the checklists and procedures were being followed, the new content should not have returned any errors in the audit. The first occurrence of non-compliance was ignored; the second occurrence resulted in an email with a screenshot of the accessibility report and a reminder "Hey, don't forget. You need to be taking a look at these things. Remember, here's the instructions" (Anthony, Milford Point, Interview 1, February 1, 2018). The third occurrence resulted in a similar email, but this time the employee's administrator was copied on the note. On the fourth occurrence, the issue was escalated to Anthony's boss, who then had a meeting with the building-level administrator. Anthony indicated that though he had gone through several levels of reminders with some employees, "it's never gotten to the point where the big guns have had to come out" (Milford Point, Interview 1, February 1, 2018). Through their structured tiered reminders, Milford Point shaped employees' enactment of the technology accessibility policy to reflect the standard the LEA sought and OCR demanded.

Once they developed a technology accessibility policy, LEAs communicated information about that policy and the associated work to internal and external

stakeholders using a variety of approaches, including their website, formal meetings, trainings, policy resources, and one-on-one communication. One of the policy communication approaches, training, also served to build technology accessibility capacity within the organization.

  Building capacity. Building capacity across the LEA was an important part of putting technology accessibility into practice, as some pieces of the LEAs' technology accessibility work, such as website management, involved numerous internal stakeholders. Having a few knowledgeable employees was insufficient for LEAs to effectively address technology accessibility. The LEAs began building capacity after they had developed some knowledge of technology accessibility and, in particular, once a few employees felt knowledgeable enough about the topic to teach others. John, who trained LEAs throughout Michigan, observed the LEAs with which he worked as they began building capacity: "… they [LEA teams] are looking at what are the barriers to training other people in-house, so that. You know, we have a technical expertise now, but how are we going to get that out" (Access Ed, Interview 1, July 12, 2018). Fred indicated that Mount Elison, an LEA that did not work with John, was grappling with similar questions as they began to build capacity: "…the question is, how do we get word out and training out to teachers to make sure their websites are accessible?" (Interview 1, February 12, 2018). LEAs used formal trainings and just-in-time resources to build capacity by disseminating the knowledge that the organizations had recently developed across the LEA both vertically (i.e., employees at different levels) and horizontally (i.e., departments and buildings).

In fact, OCR resolution agreements required capacity building through formal trainings: "the District will develop and provide training on how to ensure accessibility in web design and implementation. The training will be provided by qualified personnel… to all staff responsible for creating or posting online content to the District's website" (*OCR Resolution Agreement*, Artifact MP11). OCR held LEAs accountable for conducting training and building capacity by requiring them to provide documentation, and this drove the efforts of the two LEAs that had received OCR complaints. As Laura explained, "what's very important, that we get the schools trained on what the OCR says is compliant and just making sure that we're, we're on our way to that" (Broad Ridge, Interview 1, February 16, 2018).

The formal trainings targeted several groups of LEA employees, including school-based employees responsible for some aspect of website management or digital content creation (e.g., teachers, principals, administrative assistants), department heads, and special education staff. Formal trainings often occurred at the beginning of the school year or on a designated professional development day later in the year. For example, Milford Point chose to do their formal training at the beginning of the year because that is when they set the priorities and expectations for the coming school year; discussing technology accessibility first thing in the fall set an important tone. The formal trainings primarily occurred face-to-face, but a few of the LEAs also offered webinars. With the exception of Keystone, which chose to pay a vendor to conduct their trainings, the formal trainings were developed and facilitated by the LEA employee(s) who had been responsible for building the LEA's technology accessibility knowledge from scratch earlier in the enactment process. Consequently, the material covered in these trainings

was closely aligned with the types of knowledge that these LEA employees developed earlier in the process.

The trainings covered topics such as the LEA's technology accessibility policy, creating accessible digital content (i.e., websites and digital documents), using automated accessibility evaluation tools, OCR compliance, and why technology accessibility matters to the LEA. At Mount Elison, Fred and Rosie's training on creating accessible digital content specifically addressed alt texts, creating accessible tables, and the accessibility features of word-processing and slideshow software. A training that Laura facilitated for Broad Ridge's school webmasters focused on the importance of complying with OCR's expectations, given the complaint that was filed against them, and how to use WAVE, a free accessibility evaluation tool, to ensure web pages were compliant with OCR's expectations. Anthony was working hard to garner support for technology accessibility work at Milford Point, and he spent a lot of time early on in his trainings addressing the LEA's purpose for enacting technology accessibility:

> … it's [accessibility] still such a new thing for our employees, a lot of it was the why we're doing it…. the easiest way for me to equate it was, we do this within our classroom, we differentiate, so we have to do it for all of our community members also. As I put that to our staff, they seemed to take it a little bit easier… (Anthony, Milford Point, Interview 1, February 1, 2018)

Employees, particularly building-level webmasters, who attended formal trainings were sometimes expected to go back to their buildings or departments and train their colleagues. Ben explained the train-the-trainers model that Keystone intended to employ after their vendor came in and facilitated the initial training: "Each school has a

webmaster, somebody that manages their webpage. And we will train them, and then they will, in turn, go back and say, 'Look, if you put a picture up, it needs to have alt text'…" (Interview 1, February 26, 2018). Broad Ridge and Milford Point also employed this train-the-trainers model.

In addition to formal trainings, LEAs also used just-in-time resources and supports to build capacity. The just-in-time supports often complemented the formal trainings and supported LEA employees as they began enacting technology accessibility policy. These resources and supports included curated lists of free technology accessibility resources offered by third parties, short video tutorials, and one-on-one assistance. For example, Rosie and Fred found that their colleagues at Mount Elison needed additional supports after trainings, so they began creating short video tutorials that employees could access on demand. At Milford Point, Anthony looked through all of the websites and resources he had gathered as he worked to build the LEA's technology accessibility knowledge from scratch, and curated a list of particularly helpful resources for his colleagues, which he made available on demand through the LEA's website.

In addition to the online resources that LEA employees could access on demand, as they needed them, one-on-one assistance was also available. At most of the LEAs, the employees leading the technology accessibility work, who were seen as the resident experts, made themselves available to provide ongoing support for their colleagues who did not know how to tackle a specific accessibility issue or who needed moral support as they worked through something for the first time. Mishawaka, however, took a different approach and hired interns from a nearby university to provide one-on-one support to employees.

Mishawaka will establish a pool of interns (likely local college computer science students) who will work alongside district staff on items ranging from helping them become more technically proficient, researching technical solutions [to accessibility issues], and providing assistance on more technically difficult tasks. The design is to use a "teach them to fish" approach rather than a one-time fix.

(*Accessibility Grant Application*, Artifact MK2)

The goal of providing one-on-one support was to build technology accessibility capacity among employees, rather than just doing the various tasks for them.

Some pieces of the LEAs' technology accessibility work, such as managing websites, involved stakeholders from across the organizations and required sustained work for the foreseeable future. Consequently, building capacity was an important component of putting technology accessibility into practice. Practicing technology accessibility was one piece of the compound SLP stage of work, and LEAs entered this stage of enactment after becoming aware of technology accessibility. While they spent substantial time engaged in the SLP stage, the process extended beyond a single SLP stage; LEAs' engagement with the SLP stage was cyclical and iterative. LEAs' engagement with the first SLP stage of work led to organic iteration of their technology accessibility efforts, as they worked to refine their technology accessibility understanding and practice. The following section offers details about how LEAs iterated their work as well as the role that iteration played in the technology accessibility policy enactment process.

Iterating

Through their engagement with the three elements of the SLP stage of work, LEAs began translating the abstract ideas from technology accessibility policy into contextualized local practice, performing technology accessibility in ways congruent with their unique context. As they strategized, learned, and practiced technology accessibility, LEAs began to see ways in which they could iterate their technology accessibility efforts to (a) more closely approximate their policy ideals, and (b) better align with their context. Through iteration, LEAs entered another SLP stage of enactment, taking their strategizing, learning, and practicing to the next level by more deeply integrating technology accessibility into their everyday work. Iteration occurred organically as LEAs engaged in their first SLP stage; in other words, it was not a step in a pre-determined plan. For example, Vivian shared how Broad Ridge's thinking about technology accessibility began to expand through the team's engagement with web accessibility work:

> There was an expectation of accessibility of websites. That's the one that I think has helped us pause a moment and go, "Well yeah, that makes great sense." We're talking website, but kind of where does it apply? Everywhere. Where else does it apply to us? (Interview 1, February 8, 2018)

In this case, asking "where else does this apply to us?" led Broad Ridge to begin incorporating technology accessibility into their procurement of instructional technologies and resources. When they iterated their technology accessibility efforts, LEAs either (a) expanded the scope of their work in an existing area in a substantive way, or (b) added a new type of substantive work.

In most cases, iteration in the enactment process substantively expanded the scope of the LEAs' technology accessibility work within an existing area; specifically, iteration extended the reach of the organizations' web accessibility efforts from the LEAs' websites down to the websites of their schools and programs. LEAs used two strategies to extend their web accessibility work down to the school level: accessibility audits and training. Anika recalled a meeting in which she and her colleagues brainstormed how they might extend their technology accessibility work to the school level:

> And in one of our ADA [Committee] meetings, I made a comment like, "Hey, is there a school that we know needs more help than other schools or anything like that? And I can make sure to watch out for it a little bit more as they are putting stuff up." The response I got was pretty much, "It's all our schools. We can't single out just one, it's all of them." We've discussed possibly picking the most traveled pages on three or four of our school sites, and kind of cycling out year-to-year, which school sites are used through Accessibility Boost…. For me, I'd love to see it spread to all our district sites. I hope that's something that's going to happen. (Mount Elison, Interview 1, February 12, 2018)

Anika's hope came to fruition several months later when Mount Elison adopted a new accessibility auditing tool, AccessibilityChecker, which allowed the LEA to conduct regular accessibility audits on all of their websites for the same price they had been paying to use Accessibility Boost on just the main LEA site. Previously, Accessibility Boost's cost and page limits had been a barrier to conducting accessibility audits on all Mount Elison websites.

Keystone also expanded its web accessibility work through regular audits. Unlike Mount Elison, prior to this iteration, Keystone had not been conducting regular audits. The smallest LEA in this study, Keystone enlisted the services of its web vendor to conduct regular audits, rather than having an LEA employee run audits using a tool like Accessibility Boost, as Mount Elison and Milford Point had done. Ben received an audit report from the vendor each month via email.

In addition to regular audits, LEAs also used training as a way to extend their web accessibility work down to the school level. As part of their early iterations, both Keystone and Broad Ridge conducted web accessibility training for school webmasters. Laura explained how Broad Ridge iterated their work—extending accessibility to school sites by training webmasters—after resolving their OCR complaint:

> And we worked with the OCR and our lawyer and our Superintendent and Tom and me and we worked through it and everything was acceptable that we did. But with that said, we now have to be aware of that [accessibility]. We've done [*sic*] training when school started this year…. Every school has a webmaster or two and they learned about the new template that has come up. (Laura, Broad Ridge, Interview 1, February 16, 2018)

To conduct training for their webmasters, Keystone again leveraged the services of their web vendor, paying the vendor to facilitate the training. The LEA then expected the webmasters to go back to their schools and train their colleagues, especially those who posted content to the website.

Though most of the iteration focused on expanding LEAs' web accessibility work, in a few cases, iteration presented as an LEA adding a new type of technology

accessibility work—moving beyond web accessibility to bring technology accessibility into the classroom. To begin this type of iteration, Broad Ridge and Mount Elison incorporated technology accessibility into their procurement processes for instructional technologies and materials. The complexity of procurement made this new piece of technology accessibility work particularly challenging; both LEAs were still actively iterating their procurement work during the study. For example, Isaac described the procurement piece of Broad Ridge's technology accessibility efforts as a "work in progress" (Interview 2, July 24, 2018). At the time we spoke, Broad Ridge had iterated their rubric, which they used during procurement to evaluate instructional technologies and resources, to include technology accessibility. Specifically, the rubric said: "Digital material is able to be manipulated (closed caption, font size, sound amplified); Material is deliverable in different modalities including auditory and visually (read-alouds and transcripts); Materials are accessible and compatible with Learning Management System and current hardware" (*Procurement Rubric*, Artifact BR1). Though they had already iterated the procurement process a number of times, Isaac indicated there was more work to do.

Mount Elison's procurement process was similar to Broad Ridge's, in which committees of educators evaluated products using a rubric and multiple rounds of vetting. The difficulty Mount Elison encountered was that even though accessibility was part of the rubric, it did not carry enough weight in the process to prevent inaccessible products from being procured. The first time we spoke, Rosie had just come from a procurement meeting in which a decision had been made to adopt an inaccessible technology. She

shared her frustration and her plan to continue to iterate the work to ensure inaccessible products would not be adopted in the future:

> We ask people for input, and they gave input, a decision was made, but then, what if it's not accessible? Now where are we, because we've—so, the problem was in the rubric, obviously, and the screening process, and it [inaccessible product] shouldn't have even been considered as an option.… And, that was a learning curve for me, and that was probably a flaw in terms of what we [ADA Committee] had shared, like, "Here's what would be a good part of the process."… but then having gone through it, we realized, "Oh wait, the process is flawed." So, we have to circle back and kind of help with that.… But, again, we're going to be meeting with the March 9th, all those key players, because I talked to that person at the top, and I said, "Hey, we probably need to have a conversation, and if you could kind of invite us to one of your meetings." (Mount Elison, Interview 1, February 12, 2018)

Rosie found that even though her colleagues across the LEA were amenable to her requests and included technology accessibility in the procurement process in the way she and the ADA committee suggested, it was still possible to end up with inaccessible technology. Consequently, she realized the process, particularly the way in which it considered technology accessibility, required iteration. As Broad Ridge and Mount Elison iterated their technology accessibility efforts, adding accessibility into procurement, they found that the new piece of work also required iteration to be effective. This type of nested iteration (i.e., iteration within iteration) is also apparent in other LEAs' enactment processes.

Throughout the enactment process, LEAs iterated their technology accessibility efforts by either (a) expanding the scope of their work in a substantive way (e.g., extending web accessibility work to school websites) or (b) adding a new type of substantive work (e.g., procurement). The goal of iteration was to continue to shape the LEAs' technology accessibility efforts to more closely approximate their policy ideals and to align with their contexts.

Summary of Part 1: The Five Elements of the Process

Following is a brief summary of the findings related to research question 1: What is the process by which K-12 LEAs enact technology accessibility policy? The process comprised five elements: becoming aware, strategizing, learning, practicing, and iterating. The process always began with becoming aware, a transitional element of the process that led to the first SLP stage of work, which comprised the strategizing, learning, and practicing elements of the process. Through their engagement with the first SLP stage of work, LEAs organically iterated their enactment processes. Through iteration, another transitional element, LEAs entered subsequent SLP stages. Figure 7, at the beginning of this chapter, depicts the five elements and the relationships between them.

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Part 2: The Process Over Time

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The five elements described in part 1 are central to the enactment process, but they do not tell the entire story of technology accessibility policy enactment in K-12 LEAs. To understand the larger story, one must examine how the process unfolds over time. Technology accessibility policy enactment is not an activity that occurs over a week, a month, or even an academic year; as with any policy, enactment occurs over an

extended period of time. In fact, findings from this study indicate that the enactment of technology accessibility policy is a continual process.

How the Process Unfolds

Zooming out from the details of the process of technology accessibility policy enactment, the picture of how this process unfolded over time becomes clearer. In the zoomed-out view of the enactment process, depicted in Figure 8, the five elements of the process are still apparent. The figure illustrates that, as described in part 1, the process started with the LEAs becoming aware of technology accessibility policy. Next, the LEAs transitioned into the first SLP stage, in which they identified ways to iterate their technology accessibility efforts to more closely approximate their policy ideals. When they began iterating their work, LEAs entered a subsequent SLP stage. The cycle of SLP—iteration—SLP—iteration continued indefinitely as the LEAs strove for their policy ideals. Various contextual factors—such as support from administration, a close connection to disability, and being a novice—impacted the ways in which the process unfolded over time; these will be discussed in detail later in part 2.

In addition to the contextual factors that mediated the LEAs' enactment processes, zooming out from the details also reveals four characteristics of how the enactment process unfolds over time:

1. The work in the SLP stage was messy and multidirectional.

2. The process was continual as LEAs strove for their policy ideals.

3. The work shifted from reactive to proactive as the LEAs progressed through the process.

4. The process unfolded in a nonlinear fashion.

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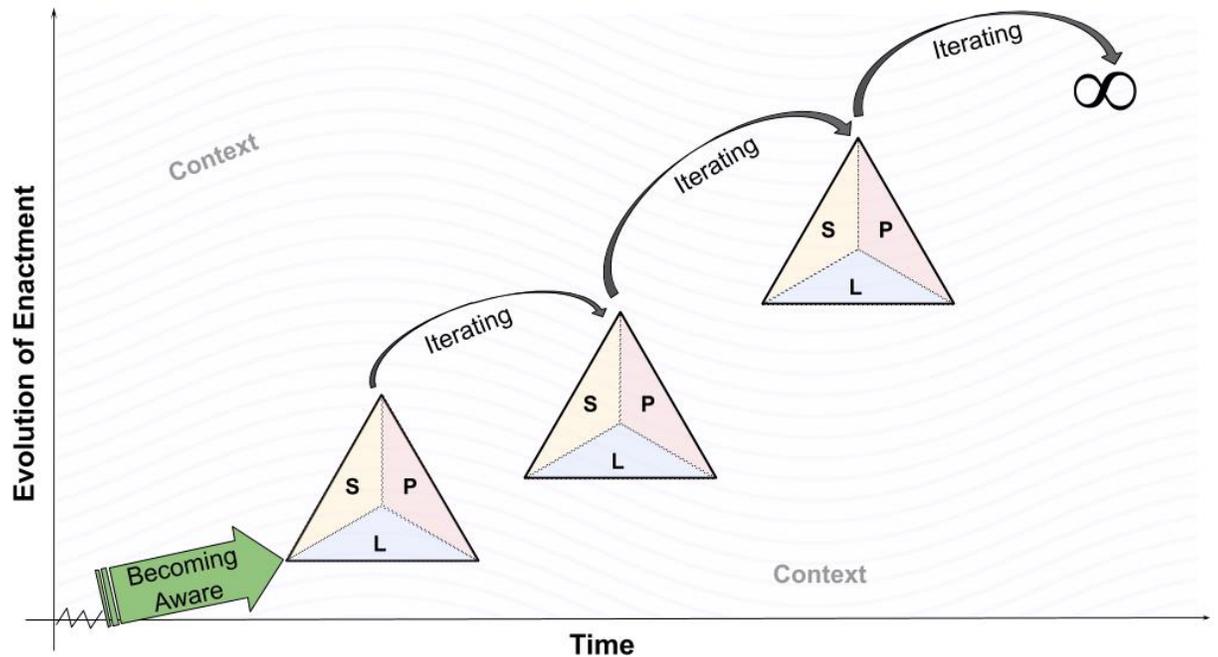
Figure 8. The evolution of the process over time. The figure illustrates how the process unfolds over time, highlighting the continual cycles of SLP—iteration—SLP—iteration that comprised the enactment process as the LEAs strove for their policy ideals. It also identifies the LEAs' contexts as factors that mediated the way in which the process unfolded over time.

This section discusses each of the four characteristics in turn.

The messiness of the SLP stage. In Figure 7, the SLP stage is represented by a triangle composed of three smaller triangles. This shape serves as a graphical metaphor for the relationships between the three elements of the SLP stage, as well as the ways in which the LEAs progressed through this stage. Most of the work during the SLP stage occurred at the intersection of two or three of the elements. That is to say, LEAs rarely engaged exclusively in a single element for an extended period of time; the elements of the SLP stage often co-occurred and informed one another. For example, Mount Elison

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and Milford Point engaged in strategizing and practicing work simultaneously during one of their SLP stages. Mount Elison implemented a formal technology accessibility policy (strategizing) while simultaneously expanding their accessibility auditing practice (practicing). Similarly, Milford Point implemented their technology accessibility policy (strategizing) while conducting trainings for internal stakeholders to build capacity (practicing).

When simultaneous work did not occur, there was often quick movement back and forth between the elements as work in one element informed work in another; this close relationship was particularly evident between the learning and practicing elements. As discussed previously, most of the LEAs were building their technology accessibility knowledge from scratch; consequently, they were unable to put technology accessibility into practice until they developed some knowledge. However, LEAs were eager to get started, so as they gained a little knowledge, they quickly put it into practice. For example, Mount Elison quickly moved from learning about creating accessible PDFs to remediating the plethora of inaccessible PDFs on their website. While practicing, they ran into a type of accessibility barrier in the PDFs that they did not know how to fix, so they quickly shifted back to learning, reaching out to a technology accessibility expert in their network. Once they knew how to deal with that barrier, they shifted back to practicing by applying their new knowledge.

Simultaneous work or rapid movement between two or three types of work also characterized early SLP stages. Broad Ridge, for example, entered their first SLP stage by simultaneously strategizing and learning and then quickly transitioning between learning and practicing. As discussed earlier in the chapter, Broad Ridge's strategy for

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resolving their OCR complaint involved remediating the identified accessibility barriers before OCR began its full investigation. In order to settle on this strategy, the LEA had to learn about potential strategies for responding to OCR complaints, as well as the actual meaning of the specific accessibility barriers outlined in the OCR letter. Therefore, Broad Ridge was simultaneously strategizing and learning. Once the LEA identified their strategy, they had to learn how to remediate the barriers and, with that knowledge, quickly make changes to their website. Speed was essential to the success of Broad Ridge's strategy, so when work did not occur simultaneously, it occurred in quick succession.

A continual process. As they engaged with the SLP stage, LEAs organically iterated their technology accessibility efforts to more closely approximate their policy ideals. Through iteration, LEAs transitioned into subsequent SLP stages. In each successive SLP stage, LEAs translated abstract policy ideas into increasingly contextualized local practice, moving closer to their policy ideals.

The cycle of SLP—iteration—SLP—iteration is shown in Figure 8 as repeating indefinitely because the LEAs felt their policy ideals were unattainable. Specifically, the policy ideal for which all of the LEAs strove was 100% accessibility—even though they felt attaining 100% accessibility was impossible for three interrelated reasons. First, the LEAs had limited time, resources, and technology accessibility expertise. For example, Anika shared the progress Mount Elison had made towards their policy ideal and explained why she felt they would never quite get there:

> … we are at 83.3% and the industry benchmark is 68.8%… It would be awesome
>
> if I could get it to 100%, but there are just certain things that I can't do, so like

captioning on our videos, or creating like a written script for people to follow on for all of our videos. I don't have the time for that... (Mount Elison, Interview 1, February 12, 2018)

Second, the amount of work required in order to transition all of an LEA's digital assets from minimal accessibility to 100% accessibility was tremendous. Milford Point also strove for but struggled to attain 100% accessibility: "Our goal is 100% accessibility. We know that's not possible. Anything that is outward facing, we know we want to be 100% accessible. We know the law says, essentially, all digital documents, even inward facing... That's almost impossible" (Anthony, Milford Point, Interview 1, February 1, 2018). Instead, Milford Point and the other LEAs chose to focus their efforts on outward-facing assets, even though the goal of ensuring they were 100% accessible felt unattainable.

Finally, 100% accessibility felt impossible because "[a]ccessibility is a moving target, in some ways. Technology is constantly changing, which means that what didn't work this month might work next month, or it might break what works already" (John, Access Ed, Interview 1, July 12, 2018). Ben also pointed to the fluid nature of technology, indicating that technology accessibility work would never be finished "because a good webpage is dynamic. It's constantly updated" (Keystone, Interview 2, July 20, 2018).

While most LEAs thought that 100% accessibility was theoretically feasible, it did not seem achievable in the real world. Despite the impossibility of 100% accessibility, the LEAs still held 100% accessibility as their policy ideal and worked toward that goal. Consequently, the LEAs viewed the process of technology accessibility

policy enactment as ongoing; they felt they would always be working on technology

accessibility: "so, it's [accessibility] just been a continuous thing and it will always be a

continuous thing" (Anthony, Milford Point, Interview 1, February 1, 2018). To maintain

the level of accessibility they sought as websites were perpetually updated and upgraded,

the LEAs felt they would have to continually attend to technology accessibility. Faced

with this reality, most LEAs focused on progress toward their policy ideals. For example,

Tom talked about the process as being not only continual but evolutionary, since each

stage builds upon the last as the LEA staff ask themselves: "What's the next piece that we

need to think about?" (Broad Ridge, Interview 2, July 11, 2018). The LEAs' focus on

progress aligned with their interpretation of OCR's expectations. Ben indicated that based

on his understanding, OCR didn't think 100% accessibility was attainable in the real

world either, and consequently, OCR was more concerned with the LEAs showing

progress towards the ideal: "They [OCR] realize that no site will be 100% compliant.

But, you're making steps, you're taking steps, making an effort to get there" (Keystone,

Interview 2, July 20, 2018).

      Shifting from reactive to proactive work. As the LEAs continued to iterate their

technology accessibility work to progress toward their policy ideals, some of the LEAs

shifted their approaches. Specifically, some of the LEAs began transitioning from

approaching technology accessibility reactively to approaching it proactively. This shift

from reactive to proactive approaches was valued and promoted in the trainings the LEAs

attended, such as those offered by Access Ed, as well as in the technology accessibility

resources they read. For example, the technology accessibility resource upon which

Broad Ridge relied heavily stated: "The goal is to support leaders in being proactive...

Being proactive begins with making accessible technology and resources an institution-wide priority and creating systems for addressing accessibility issues, including the purchasing and acquisition process for new technologies" (*Getting Started with Accessibility*, Artifact BR3). Fred observed this type of shift in Mount Elison's approach to technology accessibility—a shift he and Rosie encouraged:

> … it was all reactive. So what we're trying to do is get to a position of being proactive, and I feel like the district as a whole and I feel like now, our program, the vision program, is really being able to be forward thinking a little bit more. (Fred, Mount Elison, Interview 1, February 12, 2018)

Procurement was the primary place where LEAs began to address technology accessibility proactively, likely because procurement was discussed in most of the training materials they used. The *Getting Started with Accessibility Guide* referenced above, for example, pointed to procurement as an important piece of proactive technology accessibility work. Likewise, the *Accessibility Information for LEAs* webpage, which Mishawaka used, read: "Build in accessibility into all procurement. When purchasing hardware or software, make accessibility part of the process. Explain to vendors that accessibility is a core value…" (MK3).

Across the LEAs, proactive work occurred around the procurement of instructional materials and technologies, third-party web content, and videos. Rosie shared that the ADA Advisory Committee she chaired played a big role in convincing Mount Elison to include accessibility considerations in the procurement of all kinds of products and resources, including technology: "we [the ADA Committee] have a lot of conversations around, 'Hey, let's think through before purchases are made.' And that's

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across, that's for folks that have a physical disability, as well as any other kind of thing

going on" (Interview 1, February 12, 2018).

To comply with the OCR resolution agreement, Milford Point had a big push to

ensure the accessibility of the third-party web content they used and linked to. The LEA

developed a statement for the technology department to include in all Requests for

Proposals sent to third-party content providers:

> The AGENCY [LEA] considers universal accessibility to information a priority
>
> for all its employees and external customers, including individuals with
>
> disabilities. Under Sections 508 of the Rehabilitation Act of 1973 (29 U.S.C.
>
> sections 794 and 794d, as amended), the AGENCY elects to ensure the
>
> accessibility of its programs and activities, specifically its obligation to acquire
>
> and use accessible electronic and information technology. The contractor shall
>
> comply with Section 508 of the Rehabilitation Act of 1973, the World Wide Web
>
> Consortium's Web Content Accessibility Guidelines… (*Procurement Guide*,
>
> Artifact MP8)

Like Milford Point, Mishawaka ensured technology accessibility during

procurement by clearly communicating their expectations with vendors and requiring

them to include provisions for accessibility in the contract language. Mishawaka used this

strategy when procuring video content: "… as we are working with getting vendor quotes

for videos for programs, part of what we are requesting, we're telling them in order for

them to get the work… we want the videos to be considered accessible…" (Sarah,

Mishawaka, Interview 1, March 1, 2018). The only participating LEA that had not yet

begun incorporating technology accessibility into procurement was Keystone. By

ensuring the technology they procured was accessible, the LEAs began to address technology proactively. This shift from reactive to proactive occurred over time through successive iterations of the LEAs' technology accessibility efforts.

A non-linear process. The data clearly show that the progression of the LEAs' technology accessibility policy enactment process over time was nonlinear. The overall trend of the work was positive, as each iteration brought the LEAs closer to their policy ideals; however, the movement did not occur in equivalent increments with each iteration. Rather, there was an ebb and flow to the process; some of the iterations were more dramatic than others, and the duration of SLP stages also differed. Rosie shared how the process progressed over time at Mount Elison: "There's an ebb and flow … And I can say from year to year, even across different areas, maybe from technology or web accessibility it was stagnant for a minute or two..." (Interview 2, July 25, 2018). Anthony also observed an ebb and flow to the technology accessibility work at Milford Point:

> So, depending on the time of the school year, if it's audit time for our student
> data, all of the accessibility issues have to wait a few weeks and then I come back
> to those when I can, and vice versa. When it's beginning of the year and there's
> training going on for staff with accessibility and all the digital documents, then
> the data information is put to the side. (Interview 1, February 1, 2018)

At Mishawaka, there was an ebb and flow to the technology accessibility work that Gale connected to the LEA's ever-shifting priorities: "it's a priority topic for us. I mean it's not always the most important topic because there are day-to-day safety and security issues about students that rise to the top often…" (Gale, Mishawaka, Interview 1, March 1, 2018).

This section examined how the technology accessibility enactment process unfolded over time, describing four characteristics of the progression of the process. The following section delves more deeply into the final characteristic—a nonlinear, ebb-and-flow process—by examining why the technology accessibility policy enactment process unfolded in this way.

Why the Process Unfolds as It Does

Sometimes the progression of the technology accessibility policy enactment process was quick and drastic, and other times, there was no progress for a short period. What caused the process to ebb and flow in this way over time? Across the LEAs, contextual factors both accelerated and decelerated the technology accessibility enactment process. Each LEA, of course, was situated in its own unique context; therefore, the accelerants and decelerants differed between LEAs—some of the accelerants and decelerants were visible in nearly all the LEAs' processes, while others only played a role in two LEAs' processes. These contextual factors and the tension among them mediated the enactment process, affecting the way the process unfolded.

Accelerants. The contextual factors that supported and hastened an LEA's technology accessibility enactment process, accelerants, fell into three groups: top-down, bottom-up, and external. Top-down accelerants supported and encouraged the enactment at the LEA level, which, in turn, encouraged individuals. Bottom-up accelerants worked in the reverse direction, impacting the enactment of individuals who, in turn, encouraged the LEA. External accelerants occurred outside the LEA and supported enactment without the LEA's input.

Top-down accelerants. The three top-down accelerants that appeared in the data were legal activity, support from administrators, and existing inclusion or equity initiatives within the LEA. Legal activity appeared to have the broadest and most substantial impact, playing a role in all five enactment processes despite the fact that only two of the LEAs received OCR complaints. As discussed previously in the chapter, the legal activity initially made the LEAs aware of technology accessibility. Ben explained that it was legal activity, particularly the OCR complaints that were filed, that prompted Keystone to address technology accessibility:

> It did make a difference. I'm a little ashamed to say it, but it spurred it.… And, I give this lady [who filed the complaints] a little bit of credit, even though I didn't agree with her methods. But, people are much more aware of it [accessibility]. (Interview 1, March 1, 2018)

Mishawaka would likely have worked on technology accessibility without the legal activity, according to Gale, but it would have happened more slowly: "If we had been given this as, not so much a compliance thing to do but as a, you know, for all the right reasons, I think we would do it. We might not do it as quickly…" (Mishawaka, Interview 1, March 1, 2018). At Mount Elison, progress was very slow prior to the legal activity. Rosie and Fred had been encouraging their LEA to work on technology accessibility, but the legal activity "just made people move faster" because everyone is busy, "[s]o unless they think they're going to be in trouble for not doing something, a lot of times that will just get tabled" (Rosie, Mount Elison, Interview 1, February 12, 2018). Anika concurred that the legal component drove the LEA's web accessibility work.

Legal activity, predominantly in the form of OCR complaints, accelerated the

LEAs' enactment processes either by prompting LEAs to begin addressing technology

accessibility or by hastening technology accessibility work that was otherwise stagnant.

Therefore, legal activity had the greatest impact during the becoming aware and

strategizing elements of the enactment process.

Support from administrators was another important top-down accelerant that

served to smooth the political path for technology accessibility enactment, particularly

during the strategizing, learning, and practicing elements. Administrators supported the

LEAs enactment processes in numerous ways, including by endorsing the technology

accessibility initiatives and the employees who led them, providing financial support, and

supporting technology accessibility–related training.

The executives at Milford Point strongly and publicly endorsed the technology

accessibility effort in general and endorsed Anthony as the lead on the initiative,

providing essential political capital. Those endorsements, coupled with financial support,

made it much easier for Anthony to do his job:

> Essentially support from on high has helped a lot because, if I'm trying to have
>
> the staff, implement these policies, it's very difficult to do that as someone at a
>
> mid-manager level coming in and saying, "Hey, I need you to do this." Some
>
> people listen and some people won't, it's not a priority, et cetera. So, the support
>
> from on high, but in addition, essentially, anything that I've needed, has been
>
> provided... there was no budget for this to start with, and we just used money
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> from other areas to do it. (Anthony, Milford Point, Interview 1, February 1, 2018)

The administrators at Mount Elison also provided critical support to the technology accessibility effort; the Director of Special Education was particularly supportive of the work and bolstered the technology accessibility effort in three critical ways. First, he gave Rosie permission to be assertive when advocating for disabled kids in internal meetings, which gave her confidence and political capital she might not otherwise have had. Second, he built strong relationships with his fellow administrators across the LEA throughout his tenure, which laid the groundwork for Rosie to work interdepartmentally on technology accessibility. For example, the Director of Special Education was able to leverage his strong relationships to get Rosie and Fred onto the instructional resource procurement team so that they could push for the inclusion of technology accessibility in the procurement process, an essential component of expanding the technology accessibility work beyond the LEA's websites. Finally, the Director of Special Education supported the technology accessibility effort by sending key staff to external technology accessibility trainings and creating the time for Rosie and Fred to facilitate internal trainings.

At Broad Ridge, Tom's long-term commitment to equity and his endorsement of technology accessibility helped his staff in the technology department get on board with the work. Vivian, one of Tom's direct reports, shared: "Tom has been a champion of equity, and that permeates the whole department. That's been huge for our accessibility" (Broad Ridge, Interview 1, February 8, 2018). In nearby Kentucky, Ben, who, like Tom, led the technology department, was the reason that Keystone had a technology accessibility initiative; he heard about the legal activity, decided the LEA was going to address technology accessibility, and subsequently led the initiative.

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Administrators at the five LEAs supported technology accessibility efforts in several different ways based on their particular knowledge, skills, and beliefs. Support from administrators was critical because these leaders had the authority to allocate resources to the technology accessibility effort, and the political capital and access to communication channels to urge stakeholders to get behind the work. As Rosie shared, "they're the people that most often dictate what kind of training or what kind of communication goes out. So unless you have those people [administrators], it's not going to move forward" (Mount Elison, Interview 2, July 25, 2018).

The final top-down accelerant was having an existing inclusion or equity initiative. When LEAs had a preexisting equity or inclusion initiative they considered to be part of their organizational identity, they connected technology accessibility back to their existing work and identity. This connection made it easier for both internal and external stakeholders to understand the importance of technology accessibility and thus to support the work. As a result, the LEAs with existing inclusion or equity initiatives spent less time garnering support for the work and more time putting technology accessibility into practice.

Broad Ridge had the strongest existing inclusion initiative; the LEA's UDL initiative had been in place for 13 years. Isaac shared how central UDL was to the LEA's identity and practice:

But what's unique about us, I feel, is that everyone ties into our framework, which is UDL, and that's really what everything's focused on. Whether it's elementary, special ed or secondary, or technology even, that's what we always end up going

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back to is are we supporting the framework. (Broad Ridge, Interview 1, February 8, 2018)

Laura, a manager in the technology department, shared that UDL provided a lens through which Broad Ridge staff viewed all of their work; examining technology accessibility through the UDL lens, Laura and her colleagues quickly saw the value of technology accessibility as well as its synergy with their existing work. Since technology accessibility resonated quickly at Broad Ridge, the LEA was able to jump into the work of ensuring their technology was accessible. Their quick transition into practicing technology accessibility facilitated the dismissal of their OCR complaint.

Though not as strong or enduring as Broad Ridge's, Mishawaka's and Milford Point's inclusion initiatives helped their internal and external stakeholders draw connections between technology accessibility and their existing work and organizational identities, thereby increasing the speed with which stakeholders supported the work and, in turn, the speed with which the LEAs began practicing technology accessibility. Administrators at Mishawaka were able to leverage their existing inclusion initiative and organizational identity to secure funding from an external stakeholder for their technology accessibility work. They explained to the funder that their technology work had inadvertently strayed from the LEA's established inclusive practices, and that developing a technology accessibility initiative would help bring the technology work back in harmony with the LEA's commitment to inclusion. Across the state at Milford Point, the Superintendent penned an editorial in the local newspaper that helped external stakeholders draw connections between the LEA's technology accessibility work and the

organization's reputation as an institution that devotes extensive effort to meeting the needs of disabled students:

> Our district offers more individualized and robust Special Education support and programming than any other district in the region. This is a point of pride and we want to be sure that our digital media reflects our commitment to making public education accessible to all of our citizens. (*Superintendent's Summer Editorial,* Artifact MP10)

The Superintendent avoided potential friction from unsupportive external stakeholders by helping those stakeholders connect the LEA's technology accessibility work to the organization's inclusive identity. The LEAs with existing inclusion or equity initiatives were able to draw crucial connections between technology accessibility and their organizational identity to garner quick support; these connections helped stakeholders see the broader implications of making their technology accessible. Not only would accessible technology provide disabled people equal access, it would also help the LEA remain in alignment with their existing initiatives and identity.

Bottom-up accelerant. One accelerant that operated in a bottom-up manner was also evident across the enactment processes. This accelerant, with its close connection to disability, impacted individual LEA stakeholders who, in turn, engaged in grassroots campaigning for technology accessibility within their LEA. This grassroots campaigning accelerated the organization's enactment process by garnering support for the effort and by pushing the LEA to continue iterating the work to more closely approximate the policy ideal.

LEA stakeholders had close connections to disability either because they worked in the field of special education and had made a professional commitment to supporting disabled people, or because someone they were close to (e.g., a family member) was disabled. As Rosie said, these close connections to disability served to keep technology accessibility at the top of stakeholders' priority lists, something that was more difficult for those who did not have the same connections: "[Accessibility] is just not something that's in the forefront of somebody's brain unless they have a background [in disability] or unless if they know somebody, or they have a personal experience…" (Mount Elison, Interview 2, July 25, 2018). Four participants who played key roles in their LEAs' technology accessibility enactment processes had backgrounds in special education: Rosie and Fred at Mount Elison; Brice, the Director of Special Education at Keystone; and Theodore, the Low Incidence Coordinator at Broad Ridge. Three additional participants—Ben at Keystone, John at Access Ed, and Tom at Broad Ridge—had a close personal relationship with a disabled person.

Ben emphasized on several occasions how having a family member who was autistic helped him understand why technology accessibility was important and motivated him to do the work: "Look, if you don't have a special needs child it's [accessibility] not going to mean as much to you, and it should" (Keystone, Interview 2, July 20, 2018). Having a family member who was disabled had allowed Ben to develop, over the years, a deep understanding of people's diverse needs and how environments that do not take those diverse needs into consideration negatively impact disabled people. He shared that his underlying thought process for the work he did at Keystone was that you treat other people's family members the way you would want your family members treated. He

connected this thought process to his work on technology accessibility, explaining that if

his family member was blind and "he went to a website, I'd want him to be able to know

what was on the website" (Keystone, Interview 2, July 20, 2018). John also indicated that

his passion for technology accessibility stemmed from a close personal connection to

disability: "for me, some of it's kind of personal. I've grown up, my youngest brother has

disabilities…" (Access Ed, Interview 1, July 12, 2018). For Tom, the personal connection

was not familial; rather, the connection arose from friendship. Early in his IT career in the

private sector, Tom worked closely with a blind programmer and, as a result, understood

the needs of blind users.

John recognized that many of the LEA employees who attended his trainings did

not have the same close connection to disability, so he tried to make accessibility more

personal for participants because he felt that "quality improves when you have a personal

component to it, if you can relate to it" (Access Ed, Interview 1, July 12, 2018). John

created the personal connection for workshop participants by bringing in disabled

people's lived experience through storytelling and continually referring back to those

disabled people: "…we have Tim and Tina are the names of the two people in our

videos… And so I'll talk about how, for me, when I create content I'll often think, 'Will

the document work for Tim?'" (Access Ed, Interview 1, July 12, 2018).

The LEA stakeholders who had close connections to disability were often

passionate about technology accessibility and led grassroots campaigns within their

organizations to get other people to support technology accessibility. Ben engaged in

grassroots campaigning repeatedly at regional CIO meetings, where he continually

nudged his peers in other LEAs and tried to help them understand why technology

accessibility was important. He shared the pitch he used with his colleagues: "Look, number two, it's the law. It is a compliance issue, but more important than that it's the right thing to do. And, that's the way I sold it with our people" (Ben, Keystone, Interview 2, July 20, 2018). At home, in his LEA, Ben did not have to campaign too heavily, because as the CIO of a small rural LEA, he had the authority to decide that Keystone would enact technology accessibility. Since Keystone was such a small LEA, Ben also directly executed or supervised a great deal of the work, so he had to convince fewer people to get on board with the technology accessibility effort.

Conversely, at Mount Elison, the largest participating LEA, which had a population 6.5 times larger than Keystone's, dozens of people across the organization had to be on board with the technology accessibility effort in order for it to progress. Rosie, who was an occupational therapist (OT) by training and had been working in the field of special education for over two decades when we spoke, had a very close connection to disability and felt strongly about ensuring disabled people had equal access to all aspects of education. She began a grassroots campaign for technology accessibility at Mount Elison and enlisted Fred to help lead the mission: "Fred and I are like Frick and Frack[2] about that, for real, the two of us really work very closely…" (Rosie, Mount Elison, Interview 1, February 12, 2018). Fred described Rosie's efforts: "she's feet on the street, grassroots effort, where she's in all these meetings. But as they look to new technologies, there's a huge voice in the back of everybody's mind, like, 'What's Rosie gonna say?'" (Mount Elison, Interview 1, February 12, 2018).

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[2] Frick and Frack were ice skaters and comedians who performed together in the 1940s and 1950s (Hevesi, 2008).

Rosie and Fred's grassroots technology accessibility campaign was strategic and proactive, which required them to stay informed about the work occurring around the large LEA. To this end, Rosie invited herself to meetings and was generally a little "nosy":

> I'm like, "Hey, are you guys talking. Can I come?" Sure. They're not going to tell me no.… I think you just have to stay in-the-know a little bit. And be a little snoopish about what's going on in the district... (Rosie, Mount Elison, Interview 1, February 12, 2018)

Rosie also recognized the importance of public relations for the success of their campaign, so she tried to frame collaboration on technology accessibility around partnerships: "'Hey, want to partner with you, would love to have you as part of our team,' kind of invite them onto your team while you're inviting yourself to their meetings at the same time" (Mount Elison, Interview 1, February 12, 2018).

In meetings they invited themselves to and in other contexts, Rosie and Fred were forthright with their colleagues about what needed to happen: "… you have to be in a place where you're not apologetic… it's just stating clearly: 'This is what's needed.' And not to be, 'Oh, I'm sorry to bother you'"(Rosie, Mount Elison, Interview 1, February 12, 2018). In addition, they asked difficult questions and pushed back on their colleagues when they disagreed with their actions: "OK, well, what are you guys going to do now? Because now you have to purchase additional laptops because this [device] isn't going to work for this kiddo" (Rosie, Mount Elison, Interview 2, July 25, 2018).

External accelerants. Occasionally an external contextual factor, such as the independent actions of a third party, accelerated the LEAs' work. Specifically, both Broad

Ridge's and Milford Point's enactment processes were accelerated by work their web vendors chose to do without any input or guidance from the LEAs. The web vendor that Broad Ridge had been using for over a decade began working on accessibility after it was purchased by a much larger educational technology company: "After Websites4Schools was bought by Blackboard [actual name] they actually took it upon themselves to start working with the templates... we have a really good Web development tool and they were on top of it [accessibility] themselves…" (Laura, Interview 1, February 16, 2018). Broad Ridge did not ask their web vendor to work on web accessibility, but they benefited from the effort nonetheless. Tom provided one specific example of how the web vendor's interface accelerated Broad Ridge's technology accessibility effort: "Part of it [accessibility] is done by our website software, which actually as we build it gives us a place to add the alt tag and will handle the header sequence so that the screen is readable" (Tom, Broad Ridge, Interview 1, February 9, 2018).

Milford Point benefited in a similar way from their web vendor's independent technology accessibility work. Since the vendor, K12 Web, had already developed some accessible website templates, Milford Point didn't have to spend time explaining what technology accessibility was or why they needed a new accessible template. Consequently, Milford Point's work with their web vendor to overhaul their website went more quickly than it otherwise would have—accelerating their enactment process.

Several contextual factors accelerated LEAs' enactment processes; however, not all of the contextual factors surrounding the enactment processes served to hasten the LEAs' work. Some of them inhibited the enactment processes.

Decelerants. Decelerants were contextual factors that inhibited and slowed LEAs' enactment processes, and consequently their progression towards their policy ideals. The five decelerants were being a novice, having limited resources and competing priorities, confronting resistance within the LEA, having a large and complex website, and navigating the complexities of procurement. These five decelerants inhibited the enactment process at different stages. Navigating the complexities of procurement, for example, came up as LEAs iterated their technology accessibility efforts to include the procurement of instructional technologies and materials. Conversely, being a novice hindered the enactment process most significantly early in the process as LEAs were becoming aware and learning about technology accessibility.

Being a novice. As discussed earlier in the chapter, prior to the legal activity, most of the LEAs were unfamiliar with technology accessibility from both a legal and technical perspective: "Essentially, I had to begin in October of 2016 and start from the ground floor of someone who had never even heard of accessibility before and starting to become knowledgeable in it," (Anthony, Milford Point, Interview 1, February 1, 2018). Several of the employees who were tasked with leading a significant portion of an LEA's technology accessibility effort had no prior knowledge of technology accessibility and, furthermore, no background in web development or disability. Anika lacked a background in any of the three areas: "I had no accessibility experience when I started here. My major in college was Communications—Public Relations" (Anika, Mount Elison, Interview 1, February 12, 2018). Sometimes the technology leaders also lacked important background knowledge; Ben, the CIO at Keystone, shared, "I don't have a

technical background. I'm not a programmer. Not a coder" (Interview 1, February 26, 2018).

The impact of being a novice played out in the enactment process in several ways, particularly during the awareness, learning, and practicing elements. First, the LEAs' lack of awareness about technology accessibility allowed the legal activity to catch them off guard: "We thought everything was great and wonderful until all of a sudden we got contacted by the OCR out of the blue" (Anthony, Milford Point, Interview 1, February 1, 2018). Second, as novices, LEAs were also frequently ill-prepared to respond to the legal activity. Since they had no prior knowledge, LEAs had to first learn the language of technology accessibility, which took time. Then they had to learn the technical side of creating accessible content and remediating inaccessible content, which also took time. Taking the time to build this knowledge was critical, but it slowed the LEAs' enactment of the policy.

The third way that being a novice inhibited the enactment process was that it contributed to feelings of overwhelm during both the learning and practicing elements of the process. John explained that the novices who attended his trainings often became overwhelmed by all of the information, even though he went through things slowly and incorporated activities to help make technology accessibility more concrete: "Some of that stuff can feel really overwhelming, so it's kind of like they come in and they gain a lot of technical experience, but they also get a little overwhelmed by the vastness of it" (John, Access Ed, Interview 1, July 12, 2018). Anika discussed feeling overwhelmed as she began to put technology accessibility into practice: "The first couple of times I looked into it [remediating the website], like I said, it was pretty daunting. I didn't know where

to start. I didn't really know what to do" (Mount Elison, Interview 1, February 12, 2018). As Anika explained, she was overwhelmed both by the sheer amount of work and a lack of knowledge about where to start.

Finally, being a novice inhibited the enactment process as LEAs began to iterate their technology accessibility efforts to include school websites. At this stage, the key LEA employees working on technology accessibility were knowledgeable, but their colleagues remained novices. The school webmasters, who played a key role in making school websites accessible, were accessibility novices who also lacked technical backgrounds. Laura shared, "Our webmasters are teachers and principals. So it's not somebody who they've hired to come in and help with their website" (Broad Ridge, Interview 1, February 16, 2018). The school and department webmasters at Keystone, Mishawaka, and Milford Point were also teachers, administrators, or secretaries who were technology accessibility novices and laypeople. According to John, the teachers often felt unprepared and inadequate to address technology accessibility. Had LEAs been somewhat knowledgeable about technology accessibility, they (a) would not have been caught off guard; (b) would have been in a better position to respond to the legal activity quickly; (c) would not have felt as overwhelmed, because they would have had a better idea of how to approach the work; and (d) would have been able to iterate their work more easily.

Limited resources and competing priorities. Another decelerant that inhibited the enactment process was the combination of limited resources and competing priorities. Together, these factors significantly inhibited LEAs as they initially strategized about how to address technology accessibility, and they continued to inhibit the process as

LEAs put technology accessibility into practice. Time and money were the most limited resources that LEAs had to manage, and numerous and diverse priorities competed with technology accessibility for resources within the LEAs, including facility upkeep, student data systems, student safety concerns, daily operations, and the needs of non-disabled students. Moreover, Gale shared that technology accessibility competed with other compliance requirements for LEA resources: "… schools already have so many compliance requirements. So if you add one more to that pile they're just overwhelmed" (Mishawaka, Interview 1, March 1, 2018). As Anthony explained, LEA employees were just so encumbered with their existing work that they struggled to fit in another priority: "… they [building administrators] have a list of priorities that are 50 feet long. This is at the 51st foot to them. This [accessibility]… does not affect the day-to-day running of their building in any way, shape or form" (Milford Point, Interview 1, February 1, 2018). Rosie echoed Anthony's sentiment: "We have a lot of people that really have a good heart, and that would say, 'Yeah, totally on board with that,' it's just the getting there. It's just, there are so many other things. People are so busy" (Mount Elison, Interview 1, February 12, 2018).

To deal with the limited resources and competing priorities, LEAs had to make decisions about which priorities were most important and how resources would be allocated. Tom explained that Broad Ridge's operational expenses, such as maintaining buildings, competed with technology for resources:

> … it becomes one of which is more important? In Indiana, our technology is paid
> for by Capital Projects, and so, this is the same budget that pays for mowing
> grass. It's the same budget that pays for painting rooms… at some point you make

decisions about how much money we're going to spend in this bucket. (Interview

1, February 9, 2018)

Rosie and Theodore, a seasoned special educator at Broad Ridge, felt that the problem

was less about having insufficient resources and more about disagreements within the

LEA about how the resources were allocated. In particular, they observed tension

between the special education and general education departments about the allocation of

funds and the ownership of expenses. As Theodore explained,

… that whole thing of, who is paying for what unfortunately, you kind of get into

that game.… Special ed wherever you get your money, you pay for it. This is

tech, this is gen ed. That's what we spend our money for. (Broad Ridge, Interview

1, February 8, 2018)

The limited resources and the priorities that competed for those resources

inhibited the enactment process in three ways throughout the SLP stage. First, they made

it difficult for the technology accessibility leads to do their work. For example, due to

limited financial resources, the Accessibility Department at Milford Point only comprised

one person, Anthony, who had to oversee all of the work—an almost impossible task:

I am a one-person department for a 586-page website with 670 staff members. Of

those 670 staff members, about 150–170 are ones that are directly involved, that

need to be working with accessibility issues on a daily basis, so, one person just

trying to cover that. (Anthony, Milford Point, Interview 1, February 1, 2018)

Second, limited resources and competing priorities kept LEAs from more closely

approximating their policy ideals. At Mount Elison, for example, the LEA's staff could

not provide the high-quality closed captioning they would have liked:

… so like captioning on our videos, or creating like a written script for people to

follow on for all of our videos. I don't have the time for that, and the guy who

creates the videos just doesn't have the time for that, so we do use YouTube

[actual name], which provides a captioning service, but we know that YouTube

captioning isn't 100% all the time. (Anika, Mount Elison, Interview 1, February

12, 2018)

Third, limited resources and competing priorities hindered the LEAs' capacity-

building efforts, which limited the approximation of their policy ideal. For example, John

shared that many LEAs struggled to find a long-enough time block to conduct training:

"Once you hit the local level, most of their training has to take place in like 15-minute

segments at random staff meetings" (Access Ed, Interview 1, July 12, 18). Having limited

resources and competing priorities inhibited LEAs' technology accessibility enactment

process throughout the SLP stage.

Confronting resistance. While they were putting technology accessibility into

practice, the LEAs also confronted resistance from within their organizations, which

further decelerated their enactment processes. Rosie and Anthony both talked about

confronting resistance from their colleagues who did not want to engage in the

technology accessibility effort: "You can say, 'You have to,' all you want, and there are

still some people that are going to beg for forgiveness, because it's just easier to do that"

(Rosie, Mount Elison, Interview 2, July 25, 2018). At both Mount Elison and Milford

Point, some of the staff resisted the work, despite Rosie's and Anthony's repeated

attempts to communicate their LEA's plan and the need for the work. The staff resisted

because they did not want to change their practice, or because they had not bought into

the importance of technology accessibility; sometimes, it was a combination of the two, as Anthony explained:

> You have let's say one person out of every 100 that has some form of accessibility need. Those other 99 people don't necessarily understand why things are changing and why they need to change… you have people that have been doing their job the exact same way for 20 years, why should I change? (Milford Point, Interview 1, February 1, 2018)

LEA employees who didn't understand why change was needed, especially since the old practice worked for 99% of people, had not yet bought into technology accessibility, and, therefore, resisted the work. Rosie described having repeated conversations with those people: "Every conversation with them is, 'OK, we talked about this.' You know? In a nice way. But, you know, they just don't have a buy in, and so they're going to be a little bit of a resister." (Mount Elison, Interview 2, July 25, 2018).

The resistance from these employees hindered the enactment process, particularly as the LEAs were putting technology accessibility into practice. It decreased the efficacy of the work across the LEA and created additional work for people like Anthony who were charged with enforcing the LEAs' standards.

Large and complex website. The size and complexity of the LEAs' websites also decelerated the enactment process as some organizations practiced technology accessibility. The precise nature of each LEA's web presence and the manner in which they managed it differed. However, the technology accessibility work was understandably more time-consuming for the LEAs with a large and complex web presence—Broad Ridge, for example, had 15 websites to manage, and Mount Elison had

26. Milford Point only had one website, but it had over 15,000 pages. Anthony's explanation of the process Milford Point went through to bring the website into compliance provides an illustration of the complex and time-intensive nature of accessibility work on large sites.

> So, everything we had on our old website had to be parsed down from 15,000 pages to, my goal was 500 pages. I then met with each of our departments from the beginning of May until mid-June and we went through essentially file by file on what they had, their portion of the website. We made the decision, does it stay, does it go, is it accessible, is it not accessible, how much time would it take to make it accessible, is it easier to get rid of? With each department, we came to those decisions. As they made their decisions, I then changed up their portion of the data on the offline new website. That ran probably a solid month or so, to get all the data set. Then, we did another run through with each of the departments, letting them see their portion of it and then passed the school board. Then, we went live… (Milford Point, Interview 1, February 1, 2018)

Not only did many of the LEAs have large websites, but the responsibility for the creation and maintenance of web content was distributed across their organizations. Although having a CMS made it easy to share the workload of maintaining a website, it increased the complexity of ensuring accessibility even in a small LEA: "The problem with websites as a district, even a small district like ours, you have got so many fingers in, so many people that are doing it…" (Ben, Keystone, Interview 1, February 26, 2018). At Milford Point, as Anthony mentioned above, upwards of 200 employees had their "fingers" in the website. The impact of having distributed web authoring responsibility

meant that once all the content was accessible, a large number of staff had to be trained about technology accessibility in order to keep it that way, and they needed continuing support as they created content to ensure it was accessible.

Complexities of procurement. The final decelerant, the complexity of procurement, inhibited the enactment process during iteration. As discussed previously, two LEAs incorporated technology accessibility into their procurement processes during one of their iteration cycles. Procurement, particularly of instructional technologies and materials, involved numerous internal stakeholders and required the LEAs to work with vendors who were evasive and did not value technology accessibility. The complexity of simultaneously working with copious internal stakeholders as well as uncooperative vendors hindered Broad Ridge's and Mount Elison's procurement work. Rosie felt that incorporating accessibility into procurement was difficult because technologies and materials that are procured for instructional purposes have to satisfy the needs and desires of so many stakeholders.

Vendors who did not value technology accessibility and were at best elusive about the accessibility of their products further slowed the enactment process. Frequently, the LEAs could not find accessible products on the market that met their identified needs; as a result, they adopted inaccessible technologies. Rosie elaborated on the difficult circumstances in which the procurement committee often found itself: "… sometimes the products that are out there are just not accessible, and so they're put in a situation where they're like, "Well, you have to have something," and so they're going to do the best they can…" (Mount Elison, Interview 1, February 12, 2018). Rosie hypothesized that the

reason the available products were often inaccessible is because vendors have no legal obligation to make their products accessible.

Once the LEAs found a product that was acceptable, they began the tricky process of finding vendors who would work with them, as Isaac explained: "We've had to take some companies out in the final round [of the procurement process] because they just can't do it or will refuse to work with us in that sense" (Broad Ridge, Interview 1, February 8, 2018). Vendors often would not allow the LEAs to test fully functional copies of the product or talk with the developers prior to signing a contract; consequently, the LEAs were left wondering if the product they were buying was fully accessible. Isaac described the impact of the vendors' antics:

> … just up in the air of is it gonna work or not, or what integrations can they do, because typically [vendors] won't let us talk to a tech until we're a finalist or until we are negotiating contracts, things like that. (Broad Ridge, Interview 1, February 8, 2018)

Finally, once they had the product in-house, the LEAs sometimes discovered it was not accessible, despite the vendor's claims that it was. Once the purchase had been made, the LEAs were stuck; they did not feel they had any recourse to get the vendors to make the product accessible. Furthermore, LEAs felt they had no power to get the vendors to take them seriously. Mount Elison pushed back, but Rosie often felt they just did not have enough pull to sway the big vendors: "… Harcourt, Pearson [actual names], they're big names, right? And, so, you would think that they would have a mind for accessibility, but honestly, they are kinda like, 'We're huge, we don't have to'" (Rosie, Mount Elison,

Interview 1, February 12, 2018). As Isaac summarized, "We're a little too small to demand it, to force changes" (Broad Ridge, Interview 1, February 8, 2018).

Even though the LEAs were trying to be proactive by incorporating technology accessibility into their procurement of instructional technologies and materials, in the end, the internal and external complexities of the procurement process sometimes forced them back into a reactive stance. Both Broad Ridge and Mount Elison endeavored, through the iteration of their technology accessibility efforts, to procure accessible instructional technologies and materials, but their work was inhibited by both internal stakeholders and evasive external vendors who did not value technology accessibility.

Summary of Part 2: The Process Over Time

Following is a brief summary of the findings related to research question 2: How does the process unfold and why does the process unfold as it does? An examination of how the technology accessibility policy enactment process transpired over time revealed four characteristics:

1. The work in the SLP stage was messy and multidirectional.

2. The process was continual as LEAs strove for their policy ideals.

3. The technology accessibility work shifted from reactive to proactive as the LEAs progressed through the process.

4. The progression of the process was nonlinear.

The contexts in which the enactment process occurred impacted the way in which the process transpired; some aspects accelerated the process while other aspects decelerated it. Each LEA had its own unique context, so the accelerants and decelerants were not identical across all five LEAs. Three types of accelerants were evident in the

data: top-down (e.g., legal activity), bottom-up (e.g., a close connection to disability), and external (e.g., website providers independently addressing accessibility). Additionally, five contextual factors decelerated the process: (a) being a novice, (b) having limited resources and competing priorities, (c) confronting resistance within the LEA, (d) having a large and complex website, and (e) navigating the complexities of procurement.

Part 3: Making Meaning of the Process

To make meaning of the experience of enacting technology accessibility policy, the LEAs curated stories about their experiences enacting the policies and articulated their purposes for engaging in the work. As the enactment process evolved over time, so, too, did the meaning LEAs made about the experience.

Curating Stories

As the LEAs progressed through the elements of the enactment process, gaining knowledge and skill, the stories they relayed about their experiences evolved. The common narrative transitioned from discussions of anger and resentment about the unjust enforcement of the policy, to feelings of frustration as LEAs began to ride the wave of technology accessibility policy enactment, and, finally, to feelings of pride and fulfillment about the work. Here, the narrative is represented in two sub-sections: Resentment and Injustice and Riding the Wave.

Resentment and injustice. As discussed previously, legal activity prompted LEAs' awareness of technology accessibility policy. This reality heavily shaped the way that LEAs experienced the enactment process, especially in the beginning, when they framed it around compliance and the law. "Being in trouble" (Rosie, Mount Elison,

Interview 1, February 12, 2018), or the "threat of being in trouble" (Ben, Keystone, Interview 2, July 20, 2018) initially evoked feelings of anger and vulnerability.

Vivian relayed the reaction that she and her colleagues had to what she referred to as the "scare in compliance": "Well, the first thing it did was kind of shake people up because they got the letters that says [*sic*], 'You're not compliant'" (Broad Ridge, Interview 1, February 8, 2018). Ben analogized OCR's enforcement of the policy to "being held up at gunpoint" (Keystone, Interview 1, February 26, 2018). Tom concurred with Ben's analogy, "that's probably not far from a pretty consistent reaction in terms of how OCR came across with it" (Broad Ridge, Interview 2, July 11, 2018). Ben shared that his peers around the state were angry about the OCR complaints: "I'll be honest, in that first CIO meeting people were—of course, they were mad about being made aware of it [accessibility policy]. So the sentiment wasn't that good" (Keystone, Interview 2, July 20, 2018).

LEAs felt vulnerable because they were "in trouble" and could potentially be in more "trouble" (i.e., be subject to additional legal action) if they did not respond appropriately to the OCR complaint. They felt angry partially because they did not want the bad press that comes with "being in trouble"; Rosie explained, "… you don't want to be on the news. You just don't want to be that district that failed to do what they knew they were supposed to do" (Mount Elison, Interview 1, February 12, 2018).

LEAs were also angry because they felt the way the policy was being enforced was unjust and, furthermore, that the policy expectations were onerous. One of the biggest injustices of the OCR complaints, the LEAs felt, was that they were not filed by someone in their local community; rather, the complaints were filed by someone across

the country who they did not know or consider to be a stakeholder. Ben shared his objection to the complaints:

> This lady just files random complaints with the OCR. She has said on her
> Facebook page she wants to file so many per month.… It wasn't somebody in
> their district that couldn't view the webpage. If they [the complainant] had called,
> said, "Hey, can we fix it?" They [the LEA] would've done it like that [snaps
> fingers]. (Keystone, Interview 1, February 26, 2018)

Adding to this perceived injustice, the agency enforcing the policy was, from the LEAs' perspective, out of compliance with technology accessibility policy. Gale described the hypocrisy: "the Office of Civil Rights [sic], the Department of Justice, all of those folks weren't accessible either. So it was a bit like the pot calling the kettle black in terms of their ability to enforce it…" (Mishawaka, Interview 1, March 1, 2018). Not only was OCR being hypocritical, the LEAs felt that OCR's expectations for compliance with the law were onerous. Tom, who was well connected to technology leaders in LEAs around the country, had several colleagues who had to go through OCR's "crazy" (Laura, Interview 1, February 16, 2018) one-year plan:

> I had friends who have had to spend huge amounts of money training their district
> and responding to these [OCR complaints] in some cases.… Remediation can
> involve requiring the district to undergo regular audits, undergo training across
> the board for everybody in how to build websites that are accessible. It can be a
> very expensive, very difficult process. (Tom, Broad Ridge, February 9, 2018)

Milford Point, whose OCR complaint resulted in a resolution agreement, the type of "crazy" plan referenced above, also had direct experience with OCR's expectations for

remediation, training, and auditing. Anthony described an early phase of the negotiations

with OCR around the resolution agreement during which he and his colleagues felt some

of the expectations were unreasonable:

> Essentially, they [LEA leadership] had gone back from June until October, they
>
> had gone back and forth with lawyers and the OCR, and trying to come up with
>
> what would they need to do to even try and meet what the OCR was requesting….
>
> the law says, essentially, all digital documents, even inward facing, all nine
>
> sections need to be compliant. That's almost impossible. (Anthony, Milford Point,
>
> February 1, 2018)

> Ben, too, had friends who had dealt with OCR complaints and spent a lot of

money to meet OCR's expectations: "It cost them about $20,000, at the end of the day,

all the things they had to do" (Keystone, Interview 1, February 26, 2018). At some of the

LEAs, the feelings of anger and vulnerability settled into an undercurrent of resentment

as staff resigned themselves to complying with the law and OCR's expectations, either to

get out of "trouble" or to keep from "getting in trouble," and began addressing

technology accessibility. John characterized this resentment as a "chip on the shoulder,"

an attitude that he observed in many of the LEAs who participated in his trainings:

> In Michigan you know, you have 1,200 complaints that have been filed with the
>
> Office of Civil Rights [*sic*], so everybody who's coming to our training is coming
>
> with kind of a chip on their shoulder, in terms of, you know, "We're really here
>
> because the lawyers are after us" kind of thing… (Access Ed, Interview 1, July
>
> 12, 2018)

As the LEAs transitioned into the SLP stage of the enactment process, their stories and experiences began to diverge. Ben mentioned that some of his colleagues in other LEAs considered pulling down their websites to avoid the compliance headache altogether: "Well, we're not required to have a webpage, we'll take it down" (Keystone, Interview 2, July 20, 2018). Ben also shared that his web vendor offered a test prep–type workshop to cater to the LEAs that just wanted to do the minimum required work; in this training, the LEAs only learned how to pass the compliance test, the WAVE accessibility checker. Indeed, participants discussed LEAs in their networks that were still resentful of the law and its enforcement, and that resigned themselves to doing the minimum that was required to meet the compliance bar. However, John pointed out that inaccessible content can pass an automated accessibility check just like a misspelled word can pass an automated spelling check: "If your goal is compliance, you can pass an accessibility checker and throw something up there, and still know deep down in your heart that that document's not really accessible…" (Access Ed, Interview 1, July 12, 2018).

LEAs that focused on compliance, as John and Ben mentioned, were focused on meeting the letter of the law rather than the spirit of the law. The LEAs that participated in this study, however, were able to move beyond resentment and devote themselves to meeting the spirit of the law, as evidenced by the 100% accessibility policy ideal that they set for themselves. Anthony shared that Milford Point staff devoted themselves to surpassing compliance to ensure the LEA would meet the needs of disabled community members:

> … if we didn't change the policies, we might be able to change a few things and
> become in compliance and meet the letter of the law, but we really would not be

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meeting the needs of our members themselves. So, rather than just do the little bit

that we needed to, to become in compliance, we decided to take it from the top

down and began to implement policies aimed at educating our employees that are

involved in some of these processes… (Anthony, Interview 1, February 1, 2018)

As the LEAs continued to engage with the enactment process, entering the SLP stage and

developing a deeper understanding of technology accessibility, the stories they told about

their experience evolved.

Riding the wave. As they engaged in the SLP stage, the LEAs felt like they were

riding a "tsunami wave" (Anthony's term for the experience). During this stage of the

process, the LEAs had to navigate the complex landscape of internal stakeholder

dynamics—that is, the needs, understanding, beliefs, and practices of their employees—

while striving for their policy ideals. In doing so, the LEAs experienced a wave of

emotions from anxiety and fear, to frustration and annoyance, and, finally, to pride and

fulfillment.

Changing established LEA practices to ensure new digital content and

technologies were accessible evoked feelings of anxiety and fear. As discussed

previously, many internal stakeholders had no interest in changing their practices. As

John described what he observed in many of the LEAs with which he worked: "Yeah,

there's a lot of anxiety. There's a lot of unknown. There's a lot of, 'How are we going to

do anything different, this is the way it's always been done?' kind of mindset" (Access

Ed, Interview 1, July 12, 2018). Anthony described in detail the fear and anxiety that he

experienced as he hopped on the "tsunami wave," putting technology accessibility into

practice and trying to work with colleagues who were resistant:

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Oh my goodness! There are so many challenges. You've got budget constraints, you have personnel constraints, you have even the public itself.… You have people that have been doing their job the exact same way for 20 years, why should I change? You have other personnel that believe they have better ways of doing things that yes, it may cut some corners but it'll get the job done. Well, the problem with things like this, sometimes there is no cutting a corner, that defeats the entire purpose. It's a matter of taking all those people and trying to ride the tsunami wave of everyone's needs and try and make sure that wave doesn't crash against the shore.… It means trying to make sure that the job is done so that it benefits people while at the same time, not making everyone's lives so miserable that they lock the door as I'm walking up to their building… back in August of 2017, I had 20 secretaries in a small room with me. Twenty minutes into the meeting, I wasn't sure if I was going to get out of there alive or not. (Milford Point, Interview 1, February 1, 2018)

In addition to experiencing fear and anxiety as he began to put technology accessibility into practice at Milford Point, Anthony also felt discomfort, particularly when he had to play the role of enforcer, reminding people to follow the LEA's policy: "There are still days when I have to call up someone or take a screenshot or do the gentle reminder and whatever, that's not what I like doing. I don't enjoy that aspect of it…" (Milford Point, Interview 1, February 1, 2018). Rosie shared that she also felt uncomfortable enforcing the LEA's policy and holding her colleagues accountable early on, but with the support of her colleague Fred, she was able to learn how to "be bold" and "not be apologetic"

when communicating with her colleagues about the LEA's expectations for technology accessibility.

As they continued putting technology accessibility into practice, LEAs had to grapple with inaccessible technology that predated their technology accessibility efforts. Grappling with the inaccessible technology elicited feelings of frustration because developing work-arounds for inaccessible technology cost a great deal of time and money. Ultimately, it also negatively impacted disabled students, and that really exasperated the technology accessibility leaders. Fred, who worked directly with blind students at Mount Elison, expressed the most frustration around the "painstaking" and time-consuming work of grappling with inaccessible technology. Fred spoke of two specific inaccessible technologies that negatively impacted his students' experience and thus exasperated him:

> I jumped on a phone call to deal with accessibility and it basically halted this kid's testing, so then, we had to pull him out another hour of his classroom today to do this test… it's beyond me how a state assessment could be adopted but not be accessible… We had [another] kid that was in ST Math and ST Math [actual name] is a completely non-accessible app. It's deplorable, and you can put me on record by saying that. And I called them. You can't get through the log-in screen [using a screen reader]… so the district went and purchased a textbook that was outside of our textbook adoption to get the material at her level in Braille with tactile graphics because that was the right thing to do. (Mount Elison, Interview 1, February 12, 2018)

Though Fred was proud to work for a district that would spend the money to purchase an entirely separate textbook for a student who could not access the digital curriculum, he was frustrated that ST Math was not accessible in the first place. At Milford Point, Anthony was frustrated with the inaccessibility of Google's G Suite applications (actual name), which were integral to all types of work within the LEA. He shared his frustration with his colleagues in a training about how to use a third-party accessibility tool to check the accessibility of Google Documents: "G Suite does not have an integrated Accessibility Checker; everything must be visually checked; some parts cannot be made accessible because it is in the HTML coding (Table Header Row, for example, cannot be set); extremely frustrating…" (*Third Party Accessibility Tool Presentation*, Artifact MP3)

Navigating the complex landscape of internal stakeholder dynamics created a great deal of anxiety, fear, frustration, and exasperation. However, LEAs also experienced feelings of pride and fulfillment. Anika was proud of the progress Mount Elison had made on their technology accessibility effort, even though she knew they had more work to do, and she felt her work was important because it made a difference in the lives of others:

> I feel good that we are above the industry benchmark, I think that's real cool. I wish it could be 100% but it's just not possible.… I do think what I do is important. We have a lot of information on our website and I know that a lot of parents go to our website to be able to use things and find information and all this stuff, so I think if I can make it easier at least for one person, I am doing my job and I am hoping that I am making it easier for a lot more than just one person. (Interview 1, February 12, 2018)

Fred was also proud of Mount Elison's technology accessibility work. "I love being a part of a district that is gonna take their number-one tech person [Anika] and having them [*sic*] go back and fix broken links and broken labels" (Interview 1, February 12, 2018). Similarly, Milford Point was proud of their technology accessibility work and felt they were a leader in their state: "Our district is leading the way in the state in making enhancements to our digital media to ensure we provide Interactive Accessibility [*sic*] in accordance with the Americans with Disabilities Act and Office for Civil Rights Standards" (*Superintendent's Summer Editorial*, Artifact MP10).

Enacting technology accessibility felt a lot like riding a "tsunami," an experience that evoked strong emotions. The common evolving narrative, which LEAs shared as they relayed their experiences enacting the policy, was that technology accessibility enforcement was unjust; compliance was onerous; and putting technology accessibility into practice was intense, time-consuming, and frustrating. But in the end, technology accessibility was worth the effort because it made a difference.

Articulating Purpose

In addition to the evolution in the stories the LEAs told themselves and others about their experience enacting the policy, a progression was also evident in the stories they told about their purpose for enacting this policy. The legal activity that was the impetus for the LEAs to begin enacting technology accessibility framed the enactment process around compliance and the law, as discussed previously. Consequently, in the beginning, the LEAs' purpose for enacting technology accessibility was to comply with the law and to stay out of "trouble." Over time, however, as they engaged in the enactment process and learned more about technology accessibility, particularly how

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inaccessible technology negatively impacted disabled people's lives, the LEAs' purpose for enacting technology accessibility evolved first to the idea that technology accessibility was "the right thing to do" and later to the thought that technology accessibility was imperative to inclusive educational practice.

The trainings that LEAs attended early in their enactment processes endeavored to shift participants' reasons for enacting technology accessibility. John shared that this shift was an explicit goal of the trainings he facilitated: "… we want you to do it [accessibility], not because OCR is breathing down your neck, not because of Section 508, but we want you to do it because it's really just the right thing to do" (Access Ed, Interview 1, July 12, 2018). Similarly, Gale shared that she felt the demonstration of inaccessible technology that Mishawaka incorporated into their training provided participants with the "why":

> … that [demonstration] was probably the part that made some believers out of
> people who really felt like this was just going to be an onerous task to try to do
> without really connecting to the reason why… people walked away recognizing
> that, if [inaccessible technology] was a barrier for students and they're in the
> business of liberating human potential then this is important. (Mishawaka,
> Interview 1, March 1, 2018)

Indeed, after developing knowledge about the impact of inaccessible technology, some LEAs began to enact technology accessibility to help disabled people rather than to just comply with the law. Anthony spoke of a shift in purpose at Milford Point:

> I never want anyone to think that our school district is ever doing this
> [accessibility] for the purpose to get out of a lawsuit or anything else. It's

transformed from being a slap on the wrist to, "Hey, there's some significant

changes that we can actually make that will benefit people," and that's the route

that we're taking. (Interview 1, February 1, 2018)

Broad Ridge's purpose for enacting the policy had also evolved past compliance:

"Clearly, it's [accessibility] not something we do because the government wants us to.

It's what we do because we believe in our students and we believe that we need to give

them these opportunities and these pieces of accessibility" (Tom, Broad Ridge, Interview

1, February 9, 2018). LEAs whose purposes had begun to evolve often remarked that

doing technology accessibility for disabled people was the "right thing to do"; for

example, in a grant application, Mishawaka wrote about the work: "Primarily, it is critical

because it is the right thing to do" (*Accessibility Grant Application*, Artifact MK2). In

communicating with his colleagues, Ben explained that Keystone's purpose for enacting

technology accessibility policy was not compliance: "Look, number two, it's the law. It is

a compliance issue, but more important than that it's the right thing to do" (Interview 2,

July 20, 2018).

> For some LEAs, the evolution in purpose continued beyond helping disabled
people because it was the "right thing to do." They enacted technology accessibility
because they viewed technology accessibility as an imperative to inclusive educational
practice:

> It's [accessibility] kind of ingrained in me in terms of not, it is the right thing to
> do you can't say that it's not the right thing to do, but for me it's more of good
> teaching and what you should be doing… it's just an expectation. (Isaac, Broad
> Ridge, Interview 2, July 24, 2018)

As Isaac alluded, for these LEAs, technology accessibility was more than the "right thing to do." In fact, Rosie indicated that she did not like the connotations of the phrase:

> … it's not as much to me as, like, a feel-good thing. It's, "We must do it." It's not, "It's nice to do." We really must do it. I don't know how that kind of compares or if that makes sense, but to me, it almost, when you say, "Oh, it's the right thing to do," it kind of gives you a sense of, I don't know, like, chivalry almost. And really, to me, it's just a, "No, you have to do it, and you have to do it in a way that's seamless and doesn't make somebody feel like you're doing them a favor."
>
> (Mount Elison, Interview 2, July 25, 2018)

At Mount Elison, staff did not see technology accessibility as a favor; they saw it as an imperative. Though Tom mentioned earlier in the interview that technology accessibility was the "right thing to do," when describing what the phrase meant, Tom's description indicated that his view of Broad Ridge's purpose for enacting technology accessibility aligned with the perspective that Isaac shared above. Tom explained:

> … the first words that came to my mind were moral imperative, but that almost sounds hokey. If you have a commitment to, and a belief that all children can learn, then you really do have an imperative, and I don't know that I would say it's a moral one at that point. It's an essential part of what you're going to do that says you have to have accessible materials, and that you have to work on removing barriers… (Interview 2, July 11, 2018)

As Tom suggested above, LEAs that viewed technology accessibility as an imperative had often made a commitment to it. Gale shared that once an LEA had made a

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commitment to technology accessibility, it became more of a priority in their day-to-day work:

> … it's kind of getting behind it [accessibility] from a commitment standpoint versus compliance that I think can help make it a priority when they might otherwise just kind of be doing the minimal to get to where they need to go. I think this [commitment] kind of motivates them to make it a bigger priority. (Mishawaka, Interview 1, March 1, 2018)

At Broad Ridge, where UDL and inclusion were already integral to the LEA's work, the evolution from compliance to commitment was swift. At other LEAs, whether the evolution in the purpose occurred quickly or over a longer period of time, it coincided with the evolution in the stories the LEA told about their experiences enacting the policy.

Summary of Part 3: Making Meaning of the Process

Following is a brief summary of the findings related to research question 3: How do LEAs engaged in the process make meaning of the experience of enacting technology accessibility policy? To make meaning of their experience, the LEAs curated stories and articulated their purposes for enacting technology accessibility policy. The stories they curated for themselves and others evolved as they moved through the enactment process. In the beginning, the LEAs were angry and resentful about the unfair enforcement of the policy. As they engaged in the SLP stage, they felt like they were riding a "tsunami," an experience that they often found frustrating. In the end, however, the enactment process left LEAs feeling proud and fulfilled. Though technology accessibility was difficult, time-consuming, and sometimes frustrating, LEAs felt it was well worth the effort. As the stories the LEAs told themselves about their experience evolved, so, too, did their

purpose for enacting the policy. Early on, they enacted the policy to comply with the law. Later, the LEAs enacted the policy to help disabled people because it was "the right thing to do." Finally, some LEAs' purposes evolved one more time to the idea that technology accessibility is an educational imperative. The following section integrates the three-part findings discussed above into a substantive theory.

The Five Elements of Technology Accessibility Policy Enactment in K-12

As discussed in chapter 3, substantive theories are the outcome of CGT studies; grounded in the data collected in a study, a substantive theory explains the process of interest. This substantive theory, the Five Elements of Technology Accessibility Policy Enactment (5eTAPE), explains (a) the process by which K-12 LEAs enacted technology accessibility policy within a unique and historically significant policy context, and (b) the meaning the LEAs made through their engagement in the process.

Technology accessibility policy enactment was an evolutionary process through which the five participating LEAs translated abstract policy ideas into increasingly contextualized local practice—ways of performing technology accessibility that were congruent with their unique context (e.g., history, structure, ethos)—in order to more closely approximate their policy ideals. The process was composed of five elements: becoming aware, strategizing, learning, practicing, and iterating. The primary work of the process occurred during the strategizing, learning, and practicing (SLP) stage, a compound stage of work consisting of three interrelated elements. In this compound SLP stage, lines of demarcation between the end of one element and the beginning of another were blurry at best; the three elements often co-occurred, occurred in rapid succession, and informed one another. The sequence in which LEAs engaged with the three elements

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during the SLP stage was heavily influenced by the particulars of their context; therefore, the sequence of work during the SLP stage was unique for each LEA. Furthermore, the work that occurred during the SLP stage continually evolved through iteration; therefore, numerous SLP stages transpired throughout the enactment process.

Becoming aware and iterating were transitional elements that led to the SLP stage at different points in the process. Becoming aware represented the beginning of the process and the transition into the first SLP stage; iteration represented the transition from the first SLP stage to the second SLP stage and to each successive SLP stage as the process continued to evolve over time. Each iteration of the SLP stage built on the existing work to more closely approximate the LEAs' policy ideals. The process continued indefinitely through successive cycles of SLP—iteration—SLP—iteration, as LEAs pursued their policy ideals. Progression towards the policy ideal, however, was nonlinear; SLP stages differed in duration and iterations differed in magnitude, producing an ebb and flow to the process. The mediating effect of the contexts in which the enactment process occurred contributed to the ebb and flow of the process; specifically, certain contextual factors accelerated the process while other factors decelerated the work.

Embedded in the evolution of the technology accessibility work was an evolution in the LEAs' meaning making about (a) their purpose for enacting the policy, and (b) their experience engaging with the process. During the becoming aware element of the process, the LEAs felt vulnerable and angry, and they often resented technology accessibility policy. Consequently, their initial purpose for enacting technology accessibility policy was purely to comply with the law, which felt burdensome. During

the initial SLP stage, particularly as the LEAs developed an understanding of technology accessibility, their purpose for enacting the policy began to evolve and so did their experience of the process. At this stage, the LEAs were enacting the policy to help disabled people, and the organizations began to take ownership of the work, doing their best to meet the needs of all stakeholders. Meeting everyone's needs while simultaneously developing deeper knowledge about technology accessibility was like riding a "tsunami." It was a difficult and time-consuming endeavor that often evoked feelings of frustration and overwhelm. As the LEAs iterated their work, engaging in successive SLP stages of the process and integrating technology accessibility more deeply into their daily practices, the LEAs' feelings continued to shift. During subsequent SLP stages, the LEAs felt fulfilled by and proud of their commitment to technology accessibility. Eventually, as the process evolved, some of the LEAs enacted technology accessibility because they viewed technology accessibility as an educational imperative. In sum, though enacting technology accessibility was difficult, overwhelming, frustrating, and time-consuming, the LEAs felt it was worth the effort because addressing technology accessibility was imperative to their mission of providing equal education for all.

Chapter IV Summary

This chapter outlined this study's findings in three parts to answer the three research questions. Part 1 explained the five key elements of the technology accessibility enactment process. Part 2 explained how the process unfolded over time and why it unfolded as it did. Part 3 represented the meaning that LEAs made of their experience of enacting technology accessibility policy. Finally, the chapter advanced a substantive

theory, 5eTAPE, that explains (a) the process by which K-12 LEAs enacted technology

accessibility policy within a unique and historically significant policy context, and (b) the

meaning the LEAs made through their engagement in the process. Chapter 5 discusses

the significance and implications of these findings.

CHAPTER V

DISCUSSION

Today's K-12 classrooms are increasingly inclusive of disabled students, and technology is increasingly integrated into instruction (Freeman et al., 2017; Rose et al., 2005). Unfortunately, a plethora of the technologies used in K-12 education are inaccessible to disabled people (Shaheen & Lohnes Watulak, 2019); consequently, disabled students increasingly confront the paradoxical circumstance in which they have access to the physical general education classroom but not the learning that takes place therein because the technology that mediates that learning is inaccessible to them. In addition to illuminating the existence of inaccessible technologies in K-12, the literature suggests that technology accessibility as a practice has been elusive in the field; however, the literature offers no insight about what, if anything, LEAs are doing to address technology accessibility today.

This study's findings reveal that some work to address the equity imperative of technology accessibility is occurring in K-12. Moreover, this study contributes to the literature a substantive theory that explains the complex, messy, and ongoing process by which five LEAs enacted technology accessibility policy, a process that is similar in many ways to the ongoing nonlinear process by which other policies have been enacted in education (Ball et al., 2012; Braun et al., 2010). The substantive theory and associated findings provide important insights that the field can use, coupled with the recommendations at the end of this chapter, to move forward with the substantial additional work needed to ensure that disabled students have full and equal access to technology-enhanced education.

Research Summary

This study aimed to develop a deeper understanding of the process of technology accessibility policy enactment in K-12 LEAs and to construct a substantive theory to explain the process. Three research questions guided this constructivist grounded theory study:

1. What is the process by which K-12 LEAs enact technology accessibility policy?

2. How does that process unfold, and why does the process unfold as it does?

3. How do LEAs engaged in the process make meaning of the experience of enacting technology accessibility policy?

Data were collected at five diverse LEAs in the form of interviews and policy artifacts. The constant comparative method was used to analyze the data and construct the substantive theory.

Summary of Findings

This section outlines the three-part findings, beginning with a review of the five basic elements of the process (part 1), followed by an explanation of how the process unfolds over time (part 2). The section concludes with an explanation of the meaning that LEAs made about their experience enacting the policy (part 3). To situate this study's findings within the broader knowledge base surrounding education policy and change, the three-part findings are summarized through the lens of the study's theoretical framework, policy enactment, as well as Rogers's (2003) and Fullan's (2007) theories of change. Situating the findings of the present study within the larger knowledge base illuminates similarities and differences between technology accessibility policy enactment and the enactment of other policies and other types of educational change.

Part 1: The Five Basic Elements

Technology accessibility policy enactment was an evolutionary process through which LEAs translated abstract policy ideas into contextualized local practices. The process, which had not previously been addressed in the literature, was composed of five basic elements: becoming aware; strategizing, learning, and practicing (SLP); and iterating. The technology accessibility enactment process always commenced with becoming aware, a finding that aligns with broader conceptions of the change process (Rogers, 2003) as well as conceptions of change in the educational context (Fullan, 2007). In order for change to occur, an organization must first have knowledge of the novel practice (Fullan, 2007; Rogers, 2003). In this study, the LEAs did not become aware of technology accessibility policy, which has existed since the early 2000s, until legal action (i.e., an OCR complaint) was taken directly against them or against an LEA with which they were connected. The LEAs' lack of awareness about technology accessibility policy prior to action from a third party is not surprising, based on previous research (e.g., Noble, 2005; Wisdom et al., 2007); however, the fact that it was OCR complaints that spurred LEAs into awareness is new information. Literature from the early 2000s indicates that the existence of technology accessibility policy did not automatically translate into awareness among LEAs, even when the policy was new; advocates had to bring technology accessibility to LEAs' attention by creating state-level K-12 technology accessibility initiatives, which provided professional learning opportunities, resources, and support teams to assist LEAs (Hendricks et al., 2003; Kaplan et al., 2006; Noble, 2005; Peterson, 2005; Wisdom et al., 2007). In the early 2000s, it was state-level K-12 technology accessibility initiatives that brought technology

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accessibility to LEAs' awareness; data from this study show that in 2018, it was a series of OCR complaints that raised awareness among LEAs.

In the current study, once the OCR complaint "crusade" began, news traveled quickly between LEAs via educators' interpersonal connections, which have long been viewed as an important mechanism for gaining access to information about novel practices (Fullan, 2007; Rogers, 2003). Specifically, LEAs learned about technology accessibility through "cosmopolite interpersonal channels" (Rogers, 2003, p. 206); that is, interactions with educators outside of their organization at regional meetings and conferences, and through professional organizations. Though previous research has found that mass media is the most widely used (and most effective) communication channel for gaining initial access to information, it has been noted that when mass media is not available, such as in the Global South, interpersonal communication is often used for this purpose (Rogers, 2003). While mass media was certainly available in the participating LEAs, information about technology accessibility was not disseminated through that channel; therefore, it follows that LEAs that did not receive direct legal action became aware of technology accessibility policy via "cosmopolite interpersonal channels" (Rogers, 2003, p. 206). This finding is important because it identifies another channel that advocates could use to raise awareness about technology accessibility policy.

Once the LEAs were aware of the policy, the decision to start addressing technology accessibility was made in a variety of ways based on the structure and culture of each organization. In some cases, a single person made the decision, while in other cases, a committee made the decision. In all cases, however, the decision to start was what change and policy scholars have called an authoritative decision (Ball et al., 2012;

Fullan, 2007; Rogers, 2003)—a decision made by a few people at the top of an organizational structure who are in positions of power—as opposed to a decision made by all. In addition to providing a name for this type of decision, the work of change and policy scholars offers three insights that help explain why LEAs may have used authoritative decisions early in their technology accessibility enactment process. First, scholars have explained that these types of decisions are common in schools, given their structure and context (Ball et al., 2012; Fullan, 2007; Rogers, 2003). Second, according to Rogers (2003), authoritative decisions result in the fastest change, and swift change was important to the participating LEAs that had received OCR complaints. Third, Fullan (2007) explained that administrators often take on the responsibility of urging their organizations to embark on work that supports marginalized groups, work that likely would not occur without their leadership. Consequently, without the authoritative decisions of leaders in the participating LEAs, technology accessibility policy enactment may not have occurred. In making an authoritative decision to address technology accessibility policy, LEA leaders focused their organizations' activity by creating "frames within which practice was to be thought about and constructed" (Ball et al., 2012, p. 44).

After deciding to address technology accessibility, the LEAs began the primary work of the enactment process—strategizing, learning, and practicing—which occurred in the SLP stage. In this compound stage, the three interrelated elements of work often co-occurred, occurred in rapid succession, and informed one another; lines of demarcation between the three elements were blurry at best. During the strategizing element of the process, the LEAs engaged in interpretation whereby they made sense of

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the policy, relating their local context to the broader policy, and subsequently developed structures within which local practice would be constructed (Ball et al., 2012). The close connections between strategizing and the two other elements of the SLP stage corresponds to assertions in the literature that pre-planning should be brief and most planning should be ongoing and informed by practice; Fullan called this approach "ready-fire-aim" (2007, p. 68). In this analogy, the "ready" element acknowledges that some planning must occur prior to embarking on new work; however, the analogy emphasizes that only the planning that is absolutely necessary should occur prior to the start of active work, "fire." Refinement of the work, "aim," should occur while the work is underway; making all of the decisions prior to acting is a waste of time, as many of those decisions require knowledge that can only be developed through practice (Fullan, 2007). This finding suggests that on a practical level, LEAs beginning to enact technology accessibility may want to limit the amount of time they spend on pre-planning, and instead refine their work through iteration as the enactment process unfolds.

In the learning element, the LEAs developed knowledge about the technical, legal, and human aspects of technology accessibility through a number of avenues. As was the case for LEAs that were learning about technology accessibility at the turn of the 21st century (Hendricks et al., 2003; Noble, 2005; Peterson, 2005), professional development was a key avenue for constructing knowledge for the LEAs in this study. These findings provide detail, which is not currently available in the literature, about the content knowledge LEAs developed and how they developed it. Moreover, the findings indicate that learning was not an isolated stage in the process; learning and practicing were closely intertwined. While the LEAs had to develop some rudimentary knowledge

prior to practicing technology accessibility, a great deal of their knowledge was constructed as they practiced. Through practicing, LEAs actively constructed knowledge (e.g., they learned how to add HTML tags to elements of their websites by playing with the code on their sites), and through practicing, LEAs discovered what knowledge they still needed to develop.

In Michigan, the epicenter of the OCR complaint "crusade," Access Ed, a nonprofit devoted to supporting inclusive K-12 education, developed a technology accessibility initiative much like the AITIS project in Kentucky in the early 2000s (Noble, 2005). Like the AITIS project, Access Ed's initiative was designed to help Michigan LEAs address technology accessibility through professional development workshops as well as ongoing supports (e.g., shared resources, a learning community, and access to experts). In developing a learning community with shared resources, Access Ed provided a space where educators could teach one another about technology accessibility; Fullan recommended using the "power of peers" (2013, p. 77) to develop knowledge and accelerate change in schools. Access Ed's initiative significantly influenced Michigan LEAs' technology accessibility work by supporting their learning throughout the enactment process, serving as both a sounding board and a starting place for the questions and challenges that arose. The findings of this study suggest that Access Ed is to Michigan LEAs' current technology accessibility work what the AITIS project was to Kentucky LEAs' work in the early 2000s, reinforcing the fact that state-wide initiatives foster technology accessibility work among LEAs. It would be advantageous to explore this connection further in future research.

Through their engagement with the work of the SLP stage of the process, the LEAs continued to iterate their strategizing, learning and practicing. As they iterated their work, the LEAs were translating abstract policy ideas into contextualized local practices, ways of performing technology accessibility policy that were congruent with their unique contexts (e.g., history, structure, ethos). This translation work is critical to the enactment process, according to Ball and colleagues (2012), because policies do not tell LEAs what to do—they tell them what not to do—and the performance that LEAs develop must resonate with their contexts to be successful. Therefore, after interpreting the policy, the participating LEAs had to figure out how exactly they would perform the policy. Moreover, because each LEA has its own unique context, LEAs could not just mimic the policy performance of another institution, as that performance would have been tailored to a different context. Consequently, translating policy into practice was complex work that took time and required reflection and refinement. Each iteration within the process built on the existing work and brought the LEAs closer to their interpretations of the policy ideal. Continual iteration and refinement over time through engagement with the change process is also evident in other policy enactment processes (Ball et al., 2012) and other types of educational innovation, such as pedagogical shifts; this continual refinement is the "aim" component of Fullan's "ready-fire-aim" analogy (2007, p. 68). This finding is significant because it implies that LEAs' enactments of technology accessibility policy will not be "perfect" in their first iteration; continual refinement will be necessary.

Part 2: The Process Over Time

Zooming out from the five basic elements described in part 1, the successive cycles of SLP—iteration—SLP—iteration, which are depicted in Figure 8, elucidate that technology accessibility enactment is an evolutionary process that unfolds over a long time horizon. In fact, the findings of this study indicate that the process continues indefinitely. As the LEAs strove for their interpretations of the policy ideal, their performance of technology accessibility continually evolved, yet none of them reached their interpretations of the policy ideal, which would have brought the process to a close. The continual nature of the process makes sense within the framework of policy enactment, which conceptualizes policy as both texts and discursive processes (Ball, 1993; Ball et al., 2012; Codd, 1988). From this point of view, policies are in a constant state of becoming as they are pushed and pulled through the continual work of policy actors (Ball, 1993; Ball et al., 2012; Codd, 1988).

Consequently, as the LEAs' enactment process evolved, so, too, did technology accessibility policy; the co-constitutive evolution of the process and the policy means that technology accessibility policy enactment will be an ongoing endeavor for LEAs. The technology accessibility policy enactment process is both similar to and different from Fullan's (2007) broader conception of educational change. Fullan (2007) argued that all educational change is a complex social process and, as a result, movement is subtle and change takes years. Technology accessibility policy enactment is also a complex social process that unfolds incrementally over a long time horizon; beyond that, this policy change process has the added complexity of the co-constitutive evolution of the policy and the process.

As the technology accessibility enactment process unfolded over time, the LEAs'
performance of technology accessibility evolved through successive cycles of SLP and
iteration. That evolution, however, was nonlinear; there was an ebb and flow to the work,
and SLP stages differed in duration and iterations differed in magnitude. Various
contextual factors contributed to the ebb and flow of the technology accessibility
enactment process over time. Unsurprisingly, support from administrators was one of the
top-down accelerants that was evident in the data. Fullan (2003, 2007, 2013, 2014) and
other scholars (e.g., Marzano, Waters, & McNulty, 2005; Spillane, 2004) have long
emphasized the key role that administrators, from principals to district-level leaders, play
in the educational change process. Administrative support, however, was not the
strongest accelerant in the data; legal activity was the most influential accelerant. The
contextual factors that decelerated the process included limited resources, complex
websites, and being a technology accessibility novice. Accelerating and decelerating the
enactment process were two ways that the LEAs' individual contexts mediated the entire
enactment process, a topic that is discussed in detail later in this chapter.

Part 3: Making Meaning of the Process

Intertwined with the evolution of LEAs' performance of technology accessibility
was an evolution in LEAs' meaning making—the stories they told themselves—about
their purposes for enacting the policy and their experiences engaging with the process.
Meaning making occurred throughout the entire enactment process, from becoming
aware through iterating. Given that meaning making is foundational to social action and
practice (Levinson et al., 2009), and policy enactment and educational change are
complex social processes (Fullan, 2007; Sutton & Levinson, 2001), it follows that as

LEAs' technology accessibility performance evolved, so did their meaning making. Early in the enactment process, as they were becoming aware of technology accessibility policy in connection with legal action, the LEAs often felt vulnerable and angry, which led some LEAs to resent technology accessibility policy. As the LEAs developed an understanding of technology accessibility, they started to take ownership of the work. However, as they continued to enact the policy and tried their best to meet the needs of all stakeholders within their complex contexts, they felt like they were riding a "tsunami." The employees tasked with leading the technology accessibility efforts often felt frustrated and overwhelmed by the complexity of the work. Eventually, though, as they iterated their work and successfully translated some of the policy ideas into contextualized practices, the meaning that LEAs made of their experience shifted to fulfillment and pride.

The evolution in their purposes for enacting the policy followed a similar trajectory. Initially, LEAs enacted the policy to comply with the law. But as they engaged with the work and developed knowledge, the LEAs began enacting technology accessibility to help disabled people. Finally, some of the LEAs' purposes shifted another step to the idea that technology accessibility was an equity imperative, and that became their purpose for enacting the policy. Learning about the impact that inaccessible technology had on disabled people was a significant turning point in the LEAs' meaning making about their purposes for enacting the policy. This knowledge was particularly impactful because it facilitated the development of a purpose for enacting the policy that resonated with educators' identities.

Previous research has shown that many educators enter the profession for altruistic reasons, such as a desire to help others or to make a difference (Friedman, 2016;

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Sinclair, Dowson, & McInerney, 2006; Watt et al., 2012). What I have called the LEAs'

purposes for enacting the policy, Levinson and colleagues called the "will to policy"

(2009, p. 771), the conditions that warrant the "doing" of policy, which can be affected

by political tides. The political tide that initially created the "will to policy" for the LEAs

in this study was the OCR complaint "crusade." However, over time, the "will to policy"

shifted from compliance to a more sustainable human-focused purpose, which resonated

with educators' identities and broader purposes for working in the field. Fullan (2013)

advocated shifting away from external accountability (i.e., compliance) because it is a

costly and ineffective driver for educational change. This finding highlights the important

role that learning about the lived experience of disabled people played in shifting LEAs'

conceptions of technology accessibility policy and subsequently their "will to policy."

Consequently, providing future opportunities for educators to learn about the impact that

inaccessible technologies have on disabled people may facilitate their enactment of

technology accessibility policy.

Knowledge and Context: Two Fundamental Aspects of the Process

As outlined in the previous section, this study constructed an understanding of

technology accessibility policy enactment as a messy, complex, and ongoing evolutionary

process. This section explores in more detail two fundamental aspects of the technology

accessibility enactment process: knowledge and context. These two aspects, which

previous research has shown are also fundamental to other educational change and policy

enactment processes (Ball et al., 2012; Fullan, 2007), provide a lens through which

practitioners, researchers, and policy makers can reflect on their current work and

identify potential paths forward.

Knowledge

Fullan (2007) posited that knowledge is fundamental to any educational change. Ball and his colleagues (2012) concurred with Fullan in their theorizing about the educational policy enactment process, a type of educational change; they argued that to enact policies, educators must engage in two different knowledge development processes, interpretation and translation. Through interpretation, educators engage with the language of the policy to decode it and relate it to their unique context; in doing so, they develop answers to questions such as: What does this policy mean to our LEA, and what, if anything, do we need to do with it (Ball et al., 2012)? Translation builds on the knowledge developed through interpretation to determine how the policy will be performed in situ; translation is the movement from policy texts into practice (Ball et al., 2012). In harmony with previous enactment research, the findings of this study indicate that participating LEAs engaged in both interpretation and translation. Furthermore, as other scholars have argued (Ball et al., 2012; Fullan 2007), the knowledge LEAs developed was fundamental to their enactment processes.

Interpretation. In interpreting technology accessibility policy, the participating LEAs had to answer two key questions: What does this policy mean, and what do we need to do? In order to act upon a policy, one must first decode the policy (Ball et al., 2012), as the knowledge one develops about a policy's meaning necessarily informs one's understanding of what needs to be done. The findings of this study indicate that in decoding the policy, the five LEAs developed understandings that the policy pertained primarily, and sometimes exclusively, to one particular type of technology accessibility—web accessibility. The LEAs' interpretations of the policy differed from those of federal

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agencies and disability rights advocates. Federal agencies have interpreted disability

discrimination laws as requiring that a wide variety of technologies in K-12, including

instructional technologies such as ebooks, be accessible to disabled people (Perez & Ali,

2010; U.S. Department of Education, 2011). Disabled people have also interpreted the

laws as applying to a wide variety of K-12 technologies, as evidenced by lawsuits

brought by disabled people (*Bartleson v. Miami-Dade County School Board*, 2018;

Nightingale v. Seattle School Distrct, 2014) as well as public statements made by

disability rights advocates (Riccobono et al., 2015; Riccobono & Rosenblum, 2016).

The LEAs' interpretations of technology accessibility policy make sense when

considered in context. LEAs became aware of technology accessibility as a result of OCR

complaints that specifically addressed the inaccessibility of LEA websites. Consequently,

website accessibility received a great deal of attention in communications about

accessibility in K-12 education. Furthermore, as discussed in chapter 2, the small corpus

of K-12 literature pertaining to technology accessibility is dominated by discussions of

website accessibility. Finally, the technical standard for technology accessibility, which is

codified in the updated Section 508 regulations, is WCAG 2.0 AA, which is

predominantly a standard for ensuring websites are accessible (U.S. Access Board, 2017).

While WCAG can be applied to non-web-based technologies, web accessibility is the

dominant topic of the standard and its supporting documentation. Regardless of which

communication channels they accessed, LEAs heard the message that websites had to be

accessible. Consequently, they interpreted the policy as applying primarily to websites. If

information about other types of technology accessibility had been more widely available

to the LEAs, they may have interpreted the policy differently. This finding points to the

need to provide educators with resources pertaining to the accessibility of a wide range of technologies.

The knowledge that LEAs developed through their decoding of technology accessibility policy heavily shaped the knowledge they developed about what they needed to do and the work in which they later engaged. Given that they understood the policy to mean their websites had to be accessible, when the LEAs began to develop the content knowledge they needed to answer the question "what do we need to do?"— knowledge they developed during the learning element of the enactment process—they focused on learning about web accessibility. This knowledge in turn shaped the technology accessibility work in which they engaged later in the process. As discussed in chapter 4, three of the LEAs' work focused exclusively on the accessibility of their websites; the other two LEAs incorporated some work on the accessibility of instructional technologies during procurement cycles, but that work was not their primary focus.

Translation. Building on their interpretations of technology accessibility policy, LEAs constructed knowledge about how to perform the policy within their unique contexts. Milford Point, for example, constructed knowledge about how to overhaul their one large website and build a brand-new accessible website within the context of a tight budget, limited personnel, and a commitment to ensuring that stakeholders' needs were met throughout the transition. A few states over, Mount Elison had to develop knowledge about how to retrofit their more than 20 websites, and how to expand the use of automated accessibility evaluation tools from the main website to all of their websites without going over budget. The performance knowledge (i.e., how to perform the policy

within their unique context) that LEAs developed was not limited to performance on a grand scale or to technical work. Throughout the entire SLP stage of the enactment process, LEAs were developing performance knowledge. The technology accessibility policy did not tell LEAs how to strategize, learn, or practice in their unique contexts; the LEAs had to develop that knowledge iteratively as they enacted the policy.

The knowledge constructed through interpretation and translation was fundamental to the technology accessibility policy enactment process. The knowledge that LEAs developed as they interpreted technology accessibility policy led them to concentrate the remainder of the process around the accessibility of their websites. In order to act on their interpretations, LEAs had to develop knowledge about how to perform the policy in their contexts. Therefore, the LEAs could not have enacted technology accessibility policy without developing substantial knowledge. Moreover, the knowledge that the LEAs developed was mediated by their unique contexts.

Context

As discussed earlier in the chapter, various aspects of the LEAs' contexts served to accelerate and decelerate the enactment process. However, the role of context was not limited to accelerants and decelerants; the LEAs' contexts mediated the entire technology accessibility enactment process (Ball et al., 2012), and was, therefore, a fundamental aspect of the process. While the enactment processes of the five LEAs shared the five basic elements as well as the general pattern of progression over time, the details differed. According to policy enactment scholars, there are four contextual dimensions that play a role in policy enactment: situated contexts, professional cultures, material contexts, and

external contexts (Ball et al., 2012). All four of these contextual dimensions are evident in the LEAs' enactment processes.

Situational contexts are an LEA's history, locale, and student population (Ball et al., 2012). In this study, several situational contexts were evident; as discussed earlier, Mishawaka's and Milford Point's location in Michigan, the epicenter of the OCR complaint "crusade," mediated their enactment process. Elsewhere in the Midwest, Mount Elison had a history of providing high-quality education to blind students, and as a consequence served a sizable number of blind students and employed several teachers of the visually impaired as well as other blindness professionals. The blindness professionals, like Fred, brought critical knowledge, passion, and energy to Mount Elison's technology accessibility enactment process.

Professional culture is another contextual factor that pertains to an LEA's ethos, values, and commitments (Ball et al., 2012). Chapter 4 addressed how preexisting inclusion and equity initiatives, such as the UDL initiative at Broad Ridge, accelerated the enactment process. These initiatives were part of the professional culture aspect of the LEAs' contexts.

Material contexts are the tangible, often physical, components of an LEA, such as budget, buildings, personnel, and technology (Ball et al., 2012). Limited resources, in the form of time (i.e., personnel resources) and money, as well as the complexity of the LEAs' websites, were material contexts that mediated the LEAs' enactment processes. For example, limited time kept Mount Elison from addressing closed captioning for videos to the level that they desired. The size of Milford Point's website coupled with the

extensive use of PDFs impacted the LEA's approach to ensuring their website was accessible.

External context refers to the policy tides that flow through local and national arenas and create pressure for LEAs to behave in certain ways (Ball et al., 2012). Legal activity, particularly the OCR complaint "crusade," was a significant external context that mediated the enactment process in the five LEAs during the study. As discussed previously, two LEAs became aware of technology accessibility when they received OCR complaints directly; the three other LEAs heard about accessibility from colleagues in other LEAs that received OCR complaints.

The LEAs' unique contexts, comprising situated contexts, professional cultures, material contexts, and external contexts, mediated the entire technology accessibility enactment process, from the way that each of the five elements of the process manifested in an LEA to the details of how the process unfolded over time. The findings of this study indicate that knowledge and context are fundamental aspects of the technology accessibility enactment research. Broader research on the educational change process and more specific work on the educational policy enactment process have also found knowledge and context to be fundamental. Given the resonance of the findings of this study with previous research, knowledge and context are likely to be fundamental to the enactment of technology accessibility policy at other times and in other K-12 locales. Consequently, knowledge and context provide a useful lens through which practitioners, researchers, and policy makers can reflect upon current technology accessibility enactment and identify potential paths forward.

Recommendations

This section provides recommendations for policy makers, practitioners, and researchers who are interested in integrating technology accessibility into all aspects of K-12 practice to ensure that disabled students have full and equal access to technology-enhanced education. The recommendations are grounded in the two aforementioned fundamental aspects of the process, and thus center around developing knowledge and recognizing the mediating role that context plays in technology accessibility enactment.

Policy

Policy makers and advocates seeking to expand the technology accessibility work occurring in K-12 can assist by recognizing and working with the fundamental aspects of knowledge and context. Regarding knowledge, policy makers and advocates need to recognize that many LEAs are not aware of technology accessibility policy, and they will not become aware of the policy unless a concerted effort is made to raise awareness. While legal action was effective at raising awareness in this study, so, too, were "cosmopolite interpersonal channels" (Rogers, 2003, p. 206). Policy makers and advocates could use this additional communication channel as a mechanism for raising awareness; specifically, they might consider working within existing professional organizations and networks to create opportunities to share information about technology accessibility policy.

In addition to awareness, LEAs also have to develop content knowledge about the technical and legal aspects of technology accessibility. Unfortunately, many of the existing resources are designed for people who have some technical knowledge and, as evidenced by the findings of this study, many of the educators who are assigned to

address technology accessibility are laypeople. Consequently, policy makers and advocates could help by creating resources that are designed for laypeople and discuss the K-12 context. For example, resources that explain WCAG 2.1[3] (Kirkpatrick et al., 2018) using examples from the K-12 context would make it easier for educators to build their technology accessibility knowledge from scratch. Policy makers and advocates could simultaneously address the knowledge aspects by developing additional guidance and resources that explain how and why disability discrimination laws apply to technology and K-12, as to date that information has only been formally communicated in the 2010 Dear Colleague Letter (Perez & Ali, 2010) and the 2011 Frequently Asked Questions Document (U.S. Department of Education, 2011).

Finally, policy makers and advocates need to recognize that context mediates the technology accessibility enactment process and, consequently, the process is messy, complex, and ongoing. Therefore, there is no one perfect "solution" to the "problem" of K-12 LEAs not addressing technology accessibility. Rather, there are as many ways in which an LEA could and will enact technology accessibility policy as there are LEAs in the U.S. Consequently, presenting a streamlined, monolithic path that all LEAs should follow in order to comply with the law is not helpful. Instead, policy makers and advocates could offer loose frameworks, such as 5eTAPE, that explain how an LEA could enact the policy, and include diverse and detailed examples of how other LEAs have previously engaged in the work. Loose frameworks with diverse examples would allow LEAs to develop a general sense of what they need to do and help them begin to

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[3] WCAG has been updated since the Section 508 regulations were refreshed in 2017.

develop ideas about how to translate the general ideas into local practice by examining other LEAs' specific practices.

Practice

This section provides recommendations for how K-12 leaders, university faculty, and nonprofit leaders could leverage the knowledge and context aspects of the enactment process as paths for moving K-12 technology accessibility policy enactment work forward. K-12 leaders can leverage their context as they enact technology accessibility by building on and connecting technology accessibility to their existing work. For example, K-12 leaders who work in districts with existing inclusion or equity initiatives such as UDL could connect technology accessibility work to those initiatives. Anticipating and removing barriers is an important component of UDL, so K-12 leaders could connect technology accessibility to their UDL initiatives by demonstrating how inaccessible technologies create barriers for disabled students.

LEAs that have already begun to address the accessibility of their websites should leverage their web accessibility knowledge to ensure that web-based instructional resources (e.g., LMS, web apps) are also accessible. To do this, LEAs should incorporate technology accessibility considerations into their instructional technology and resource procurement processes, just as they incorporate the considerations of other features that they consider essential. Technology accessibility can be incorporated into the procurement process in three key places: in requests for proposals, in the rubrics used to evaluate products, and in the contract between the LEA and the vendor. Lazar et al. (2015) offered helpful information about how to incorporate technology accessibility into vendor contracts, including example contract language. To gain greater traction with

vendors who are apathetic to the need for accessibility, LEAs could consider teaming up with other LEAs to approach vendors and demand accessible technologies—a strategy that Broad Ridge employed in their vendor negotiations.

K-12 leaders need to recognize that building technology accessibility knowledge from scratch takes time and can be frustrating, but taking four key steps can decrease the time and mitigate the frustration. First, LEAs that employ people with technical backgrounds should consider involving those individuals in the technology accessibility work to shorten the learning curve. LEAs that do not employ people with technical backgrounds could consider pulling in that expertise by recruiting their high school students who are studying information technology or computer science to serve as interns, or by hiring interns from local colleges and universities. Second, LEAs could identify professional development workshops and other resources offered by local nonprofits or technical assistance centers that their team can leverage to help build their knowledge. Third, LEAs could provide opportunities for their employees to learn about the impact that inaccessible technology has on disabled people; such learning opportunities engendered a key shift in the enactment process at participating LEAs. Involving disabled people (e.g., students, employees, community members) in the technology accessibility work would provide such a learning opportunity and would help ensure that the LEA's technology accessibility work resonates with the lived experience of disabled people. Fourth, LEAs could facilitate knowledge and resource sharing as well as collaboration between their special education and technology departments. Specifically, the departments could be encouraged to collaborate around technology development and procurement.

University faculty as well as nonprofit leaders could support LEAs' knowledge development by providing more opportunities to learn about and integrate technology accessibility best practices. Within higher education, college of education faculty across institutions could collaborate to develop an initiative to incorporate technology accessibility into courses across the curriculum (e.g., education law, instructional technology, special education) to ensure that future teachers and administrators have a fundamental understanding of the technical, legal, and human components of the work. To develop such an initiative, faculty could look to the Teach Access initiative—a collaboration between industry, higher education, and disability advocates, which is designed to teach future technologists about accessibility—for ideas and potential collaboration opportunities (Teach Access, 2019).

Nonprofit leaders who wish to support LEAs in their enactment of technology accessibility could collaborate with higher-education faculty to develop the aforementioned initiative and provide a variety of supports directly to LEAs. In developing a collection of supports for LEAs, nonprofit leaders should keep in mind that technology accessibility policy enactment is mediated by context and the process is continual. Consequently, supports need to be ongoing, as isolated professional development workshops are unlikely to be helpful on their own. Furthermore, supports need to be flexible in order to facilitate enactment in various contexts. The supports provided by Access Ed, which included multi-day professional development workshops, a learning community, access to technology accessibility experts, shared resources, and office hours, are good examples of flexible ongoing supports that recognize the role that context plays in the enactment process.

Research

Given the small corpus of available literature, which was discussed in chapter 2, a great deal of additional research about technology accessibility in K-12 is needed in order to better understand current practices as well as the most useful ways to move the field forward. Three specific lines of future research arise from the results of this study.

First, additional research to understand the technology accessibility policy enactment process at different times and in different places would help to further explicate the process and would contribute to a better understanding of the ways in which context mediates the process. The current study was conducted during a time when legal and policy activity was unusually high, between the thousands of OCR complaints and the update to the Section 508 regulations. In three or four years, when the technology accessibility policy tide is likely to be low, it would be helpful to return to the five participating LEAs and others who began their technology accessibility work between 2014 and 2018 to see how they are enacting technology accessibility. It would also prove useful to examine the enactment process at other LEAs, particularly those outside of the Midwest, while the policy tide is still relatively high.

Second, to better understand the knowledge aspect of the technology accessibility policy enactment process, two additional studies would be advantageous. First, a study conducted in collaboration with LEA stakeholders could aim to understand: (a) what characteristics of the currently available technology accessibility learning opportunities (e.g., professional development workshops, online resources) contribute to or detract from their usefulness; (b) what types of learning opportunities they would like but cannot find; and (c) the ways in which they currently engage with the available learning

opportunities. Such a study would provide information that would help in the development of technology accessibility learning opportunities that are specifically tailored to the needs of diverse LEAs. Additionally, a large-scale study examining technology accessibility awareness among K-12 stakeholders would provide a window into the state of initial knowledge within the field, information that could also be used to inform the development of learning opportunities.

Third, a study of the lived experience of disabled students confronting inaccessible technologies in school should be conducted. Learning about the impact that inaccessible technology has on disabled people had a significant impact on the LEAs' technology accessibility enactment processes, as it shifted their purposes for enacting the policy. A study of disabled students' lived experience would produce much-needed scholarly knowledge, given that information about the impact of inaccessible technology on disabled youth is absent compared to research on the impact of inaccessible technology on disabled adults. Furthermore, such a study could facilitate the sharing of numerous, diverse disabled students' stories with K-12 stakeholders, information to which they do not currently have access. The LEAs in this study learned about the impact of inaccessible technology from workshop presentations given by blind people, usually adults. Since inaccessible technology affects a broad range of disabled people, having a diverse collection of disabled youths' stories to share would prove useful.

Conclusion

In technology-enhanced education, technology accessibility is an equity imperative and a legal requirement; without it, disabled students confront exclusion and barriers to learning. The current literature offers no insight about what work, if any,

LEAs are doing to address technology accessibility today. This study contributes to the literature a substantive theory, 5eTAPE, that explains the complex, messy, and ongoing evolutionary process by which five LEAs enacted technology accessibility policy within the unique and historically significant policy context of the 2018 calendar year. 5eTAPE specifically explicates what is involved in the process, how the process unfolds over time and why, and the meaning that LEAs made of their experience engaging in the process. The substantive theory and associated findings provide insights that the field can use to move forward and begin integrating technology accessibility into all aspects of K-12 practice to ensure that disabled students have full and equal access to technology-enhanced education.

Enacting technology accessibility policy required substantial work, as well as support from stakeholders; the policy was not automatically integrated into practice through an effortless process. This substantial work drastically improved the accessibility of the LEAs' websites, the primary focus of most of the LEAs' work. In this dissertation, I have argued, in concert with the five participating LEAs, that while the LEAs have engaged in important technology accessibility work and have made critical progress toward more accessible websites, their technology accessibility work, and that of K-12 more broadly, is not finished.

Disabled students need access to all of the technologies used within their LEAs in order to have full and equal access to technology-enhanced K-12 education. Therefore, continued iterative enactment of technology accessibility policy is necessary to expand the work beyond LEA websites and integrate technology accessibility into all aspects of K-12 practice. The findings of this study demonstrate that LEAs leverage resources and

support from various stakeholders during the enactment process. Ergo, ensuring disabled

students have full and equal access to the technology-enhanced education of today and

tomorrow will require substantial effort and collaboration between practitioners, policy

makers, researchers, and disabled people. Though the work will not be simple or

straightforward, participants in this study indicated that technology accessibility was

worth the effort. As Gale and Tom articulated, if you are "in the business of liberating

human potential" (Mishawaka, Interview 1, March 1, 2018) and you "believe that all

children can learn" (Broad Ridge, Interview 2, July 11, 2018), then technology

accessibility is an equity imperative.

Appendix A

IRB Approval

APPROVAL NUMBER 1711026712

MEMORANDUM

TO: Natalie Shaheen

FROM: Institutional Review Board for the Protection of Human
            Participants, Elizabeth Katz, Chair

DATE: January 18, 2018

RE: Approval of Research Involving the Use of Human Participants

Thank you for submitting an Application for Approval of Research Involving the Use of Human Participants to the Institutional Review Board for the Protection of Human Participants (IRB) at Towson University. The IRB hereby approves your proposal titled:

K-12 Technology Accessibility Policy Enactment: Understanding the Process and Constructing a Grounded Theory

Please note that this approval is granted on the condition that you provide the IRB with the following information and/or documentation:

NA

If you should encounter any new risks, reactions, or injuries while conducting your research, please notify the IRB. Should your research extend beyond one year in duration, or should there be substantive changes in your research protocol, you will need to submit another application for approval at that time.

We wish you every success in your research project. If you have any questions, please call me at (410) 704-2236.

cc: Sarah Lohnes Watulak

12/18/2017

Natalie Shaheen   Education Technology & Literacy

K-12 Technology Accessibility Policy Enactment: Understanding
the Process and Constructing a Grounded Theory

NA

1711026712

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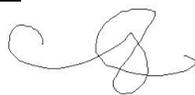
Appendix B

Table 3

List of Participants and Interview Data

Participant	LEA	Role	Initial sampling	Theoretical sampling
John	Access Ed	Consultant	7/12/18	—
Emily	Broad Ridge Independent School District	UDL Facilitator	2/9/2018	—
Isaac	Broad Ridge Independent School District	Coordinator of Instructional Technology	2/8/18	7/24/18
Laura	Broad Ridge Independent School District	Information Systems Leader	—	2/16/18
Melissa	Broad Ridge Independent School District	UDL Coordinator	2/9/18	—
Theodore	Broad Ridge Independent School District	Low Incidence Coordinator	2/8/18	—
Tom	Broad Ridge Independent School District	Director of Technology	2/9/18	7/11/18
Vivian	Broad Ridge Independent School District	Coordinator of Operational Systems	2/8/18	—
Ben	Keystone School District	Chief Information Officer	2/26/2018	7/20/2018
Brice	Keystone School District	Director of Special Education	2/26/2018	—
Anthony	Milford Point School Corporation	Accessibility Coordinator	2/1/2018	—
Gale	Mishawaka Area Co-Op	Deputy Superintendent	3/1/18	—
Sarah	Mishawaka Area Co-Op	Director of Communications	3/1/18	—

Anika	Mount Elison Schools	Digital Content Specialist	2/12/2018	—
Fred	Mount Elison Schools	Teacher of the Visually Impaired	2/12/2018	—
Rosie	Mount Elison Schools	Coordinator of Occupational and Physical Therapy; ADA Compliance Officer	2/12/18	7/25/18

Note. Interviews occurred during both the initial and theoretical sampling phases of data collection. However, not all participants were interviewed during both phases of data collection.

Appendix C

Interview Protocols

Initial Sampling Interview Protocol

Intro. Thank you so much for your time today. I need to start by giving you this cover letter, which explains that: participation in this study is strictly voluntary, your participation in this study will not affect your employment standing in any way, this interview will take 45–90 minutes, you may discontinue your participation in this study at any time, and your identity will be protected in the reporting of this study through the use of pseudonyms and other de-identification techniques. Do you have any questions about the material covered in the cover letter?

As I mentioned in my email this interview is part of my dissertation research project, which examines how proactive K-12 local education agencies (LEAs), like yours, are adopting and implementing technology accessibility. For the purpose of this study the term technology accessibility refers to mainstream technologies, as opposed to assistive technologies, and how or to what extent the technology facilitates access for people with disabilities. An accessible technology, according to this definition, provides people with disabilities the same level of access as their non-disabled peers.

I am really interested in how LEAs think about accessibility policy and put it into practice. In this interview I am going to ask you to tell me about your experience working on accessibility within the district. It is important to note that there are no right answers; I am interested in your perspective.

With your permission, I would like to record this interview to ensure I accurately capture your thoughts and experience. May I have your permission to record this interview?

Recording Started. This is Natalie interviewing [participant's name] at [location] on [date]. [Participant's name], you gave me permission to record this interview a moment ago offline, but I'd like to ask for your permission a second time so that I have it documented. May I have your permission to record this interview?

Wonderful, thank you. We are going to start with a few brief background questions. Then I will ask you some open-ended questions about your experience and work in the district related to technology accessibility and policy. Remember that there are no right answers.

Background Questions.

1. What is your job title?

2. In which department/team/group do you work?

3. How long have you worked with the local education agency (LEA)?

4. Can you tell me about what you did before you worked for the LEA in this capacity?

Open-Ended Questions. Interviewer note: The probes for each open-ended question were only asked if necessary. The level of detail a participant shared in their initial response determined whether or to what extent probes were necessary. When necessary, only those probes that were relevant were posed to the participant.

1. How would you characterize the LEA?

    Probe: Tell me about the students that the LEA serves.

Probe: Tell me about the structure of the LEA.

Probe: Tell me about the community in which the LEA is situated.

2. Can you tell me the story of how the LEA came to work on technology accessibility?

Probe: Can you tell me about the events that led to the LEA's work on accessibility?

Probe: Who, if anyone, influenced the LEA's initial move to work on accessibility? Tell me about how that person influenced the district's accessibility work?

Probe: Can you tell me about any local or federal policies, which you are aware of, that played a role in the LEA's initial work on accessibility?

Probe: What did the LEA's initial work on accessibility look like? What aspects of accessibility was the LEA most focused on?

3. Can you tell me about the work the LEA is doing in the area of technology accessibility now?

Probe: How would you characterize the LEA's work in the area of technology accessibility?

Probe: How do you feel about the LEA's work in the area of technology accessibility?

Probe: How does the LEA judge its own work in accessibility? If the LEA is living up to its own expectations regarding accessibility, what does that look like?

Probe: Who [individual/department] is involved in the accessibility work at the LEA? What role does each person or department play? How do those individuals/departments collaborate?

Probe: Which stakeholders champion or encourage the LEA's accessibility work? How do these people support and/or enhance the LEA's accessibility work?

Probe: Can you tell me about any policies or practices that the LEA has put in place regarding technology accessibility? Why has the LEA put those policies/practices into place?

Probe: Can you tell me about any local or federal policies, which you are aware of, that play a role in the LEA's current work on accessibility? What role do those policies play? Why do those policies play a role in the LEA's accessibility work?

4. Tell me about your role in the LEA's accessibility work?

Probe: Can you tell me about how you came to be involved in the LEA's accessibility work?

Probe: Tell me about the accessibility work that you typically do?

Probe: Who do you work most closely with to accomplish your accessibility work? How do you collaborate?

Probe: How, if at all, does the accessibility work that you do overlap with other programs or initiatives at the LEA?

Probe: Can you tell me how and when you first learned about accessibility?

Probe: What are your thoughts and feelings about accessibility? How, if at all, have your thoughts and feelings about accessibility changed over time?

5. Can you tell me about the resources and supports that have been important in the LEAs implementation of accessibility?

Probe: When you have a question about accessibility or when you need more information, where or to whom do you turn?

Probe: Has any organization/institution/individual been helpful to the LEA in implementing accessibility? How has that person/entity been helpful?

Probe: Can you tell me about any accessibility resources or supports that you and your colleagues have developed for yourselves or others in the LEA? What prompted you to develop those resources/supports?

Probe: Can you tell me about accessibility resources or supports that you have looked for or wanted but could not find or access? How would those resources/supports have been helpful?

6. As you look back on the LEA's accessibility work over the years, are there any events or dynamics that stick out in your mind? Can you tell me about them?

Probe: Why do you think the LEA's accessibility work has progressed as it has?

Probe: What motivates the LEA to continue working on accessibility?

Probe: Can you tell me about any challenges the LEA has faced in implementing accessibility? How have those challenges impacted the LEA's accessibility work?

Probe: After having the experiences that you have had with accessibility work, what advice would you give to LEAs that are just beginning to work on accessibility?

7. Looking into the future, what do you think the LEA's accessibility work will look like in the years to come?

Probe: Where do you see the LEA in two years [five years, 10 years] with respect to accessibility? What will drive the LEA's accessibility work in that direction?

8. Is there something else that you think I should know to better understand the LEA's work in accessibility or the process of implementation?

Probe: Is there anyone else that I should talk to in order to understand the LEA's work in the area of accessibility?

Thank you for being so generous with your time today and for answering my questions. You have provided some very helpful insight into the LEA's accessibility work.

Earlier you mentioned [resource or document]; would you be willing to share that [resource or document] with me so that I can deepen my understanding of the important work that you are doing? Are there any other resources, documents, or policies that you or your colleagues have used or developed to facilitate the LEA's accessibility work? Would you be willing/able to share any of those documents with me?

You mentioned that I should talk to [name]; would you mind connecting me with them, so that I can reach out to schedule an interview? Thanks again. If you have any

questions about the study or your participation in the coming weeks, please do not hesitate to contact me.

Theoretical Sampling Interview Protocol

Intro. Thank you so much for your time today. I need to start by reminding you that: participation in this study is strictly voluntary, your participation in this study will not affect your employment standing in any way, this interview will take 30–45 minutes, you may discontinue your participation in this study at any time, and your identity will be protected in the reporting of this study through the use of pseudonyms and other de-identification techniques. Do you have any questions about the material covered in the cover letter?

As I mentioned in my email, the purpose of this interview is to (a) gain a better understanding of key aspects of the district's technology accessibility work and (b) to determine the extent to which certain aspects of the process of working on technology accessibility are similar or different across districts.

With your permission, I would like to record this interview to ensure I accurately capture your thoughts and experience. May I have your permission to record this interview?

Recording Started. This is Natalie interviewing [participant's name] at [location] on [date]. [Participant's name], you gave me permission to record this interview a moment ago offline, but I'd like to ask for your permission a second time so that I have it documented. May I have your permission to record this interview?

Background Questions. Interviewer note: Only new participants were asked these questions.

1. What is your job title?

2. In which department/team/group do you work?

3. How long have you worked with the local education agency (LEA)?

4. Can you tell me about what you did before you worked for the LEA in this capacity?

Open-Ended Questions. Interviewer note: Participants were only asked the open-ended questions that were relevant to their experience and their LEA's work. None of the participants were asked all of the open-ended questions.

1. Can you tell me about the time you first heard about accessibility?

   Probe: What was your reaction when you first learned about accessibility?

   Probe: What questions did you have when you first learned about accessibility?

2. Several participants have told me that they first heard about accessibility when other K-12 districts received OCR letters about their websites being inaccessible. Can you tell me about when you first heard about OCR sending letters to districts with inaccessible websites?

3. One participant explained that when they received a letter from OCR about their website being inaccessible it felt like "being held up at gunpoint." How does that sentiment compare with your feelings when you received the OCR letter or heard about the OCR letters being distributed?

4. Can you tell me in your own words what accessibility means?

5. How, if at all, have your thoughts and feelings about accessibility changed over time?

6. Several participants have told me that they view accessibility as the "right thing to do." How does that view compare with your view of accessibility?

   Probe: Can you tell me in your own words what "it's the right thing to do" means?

7. Other participants have told me that, at times, accessibility work feels burdensome and overwhelming. How, if at all, do those sentiments resonate with your experience doing accessibility work?

   Probe: Can you tell me more about feeling overwhelmed or burdened?

8. When the district becomes aware of a new priority, like accessibility, how does the district fit the new priority into its workflow among the myriad existing priorities?

   Probe: When the district decided to make accessibility part of its work, how did the district accommodate the new work?

9. How does the district determine which of its many priorities is the most important?

   Probe: A participant at another district told me that they would have worked on accessibility without OCR handing out letters, but they might not have done it as quickly. How, if at all, does that sentiment compare with your experience?

   Probe: Some participants have told me that the time of year plays a role in which of their priorities get the most attention. How, if at all, does this idea of seasonal priority rotation resonate with your experience, particularly in managing accessibility work?

10. Can you tell me about how the district decided to start working on technology accessibility?

> Probe: Who made that initial decision to start working on accessibility?

> Probe: How did the district determine who would be responsible for the accessibility work?

11. Can you tell me about the experience of getting started with accessibility work?

> Probe: What was the hardest part about starting the accessibility work?

> Probe: What was the easiest part about starting accessibility work?

12. Participants at other districts have told me that in the beginning of their accessibility work they felt like they were "playing catch-up." How does that sentiment compare with your experience?

13. How has the district's work on accessibility progressed or developed over time?

14. How, if at all, does the district's accessibility work overlap with the districts other priorities or initiatives?

15. Several participants have said that their district is a "work in progress" with respect to accessibility. How does that sentiment compare with your perception of your district's accessibility work?

> Probe: Can you imagine a time when you would feel like your district was no longer a "work in progress" with accessibility?

16. What, if any, accessibility work would you like to see the LEA doing that is not pragmatic/possible at this time but might be pragmatic in the future?

17. Can you tell me about a time when you learned that a technology in the district was inaccessible and was, perhaps, posing a barrier for someone with a disability?

Probe: How did the district proceed?

Probe: How was the decision about what to do next made?

18. When procuring new technology, how does the district advocate for its needs with vendors?

19. What do you think are the most important ways to incorporate accessibility into practice in K-12? How did you discover/create them?

20. After having the experiences that you have had with accessibility work, what advice would you give to LEAs that are just beginning to work on accessibility?

21. Earlier you mentioned [resource or document], would you be willing to share that [resource or document] with me so that I can deepen my understanding of the important work that you are doing?

Thank you for being so generous with your time today and for answering my questions. You have provided some very helpful insight into the LEA's accessibility work.

Appendix D

Table 4

List of Artifacts

ID	Title	LEA(s)/Organization
AE1	*Access Ed Handout*	Access Ed
AE2	*Workshop Feedback*	Access Ed
BR1	*Procurement Rubric*	Broad Ridge Independent School District
BR2	*OCR Complaint Data*	Broad Ridge Independent School District
BR3	*Getting Started with Accessibility*	Broad Ridge Independent School District
KS1	*Website Accessibility Evaluation*	Keystone School District
KS2	*Web Accessibility Policy*	Keystone School District
ME1	*Accessibility Letter to Publishers*	Mount Elison Schools
ME2	*A11y 101 Training Slides*	Mount Elison Schools
ME3	*Accessibility Resource*	Mount Elison Schools
ME4	*Website Accessibility Complaint Form*	Mount Elison Schools
ME5	*Web Accessibility Policy*	Mount Elison Schools
ME6	*Accessibility Web Page*	Mount Elison Schools
ME7	*Policy Committee Meeting Agenda*	Mount Elison Schools
ME8	*Policy Committee Meeting Minutes*	Mount Elison Schools
ME9	*Website News Story*	Mount Elison Schools
MI1	*Department of Education OCR Resolution Agreement*	Mishawaka Area Co-Op & Milford Point School Corporation
MI2	*OCR Letter to Department of Education*	Mishawaka Area Co-Op & Milford Point School Corporation
MI3	*OCR Letter to Advocate*	Mishawaka Area Co-Op & Milford Point School Corporation
MK1	*Seminar Agenda*	Mishawaka Area Co-Op
MK2	*Accessibility Grant Application*	Mishawaka Area Co-Op

MK3	*Accessibility Information for LEAs*	Mishawaka Area Co-Op
MK4	*Seminar Announcement*	Mishawaka Area Co-Op
MP1	*Website Redesign Timeline*	Milford Point School Corporation
MP2	*Administrators and Department Meetings re OCR Website Requirements*	Milford Point School Corporation
MP3	*Third Party Accessibility Tool Presentation*	Milford Point School Corporation
MP4	*Q1 Board Update*	Milford Point School Corporation
MP5	*Why Accessibility? Slides*	Milford Point School Corporation
MP6	*Digital Document Accessibility Checklist*	Milford Point School Corporation
MP7	*Instructions for Content Editors*	Milford Point School Corporation
MP8	*Procurement Guide*	Milford Point School Corporation
MP9	*Web Accessibility Statement*	Milford Point School Corporation
MP10	*Superintendent's Summer Editorial*	Milford Point School Corporation
MP11	*OCR Resolution Agreement*	Milford Point School Corporation
MP12	*OCR Letter*	Milford Point School Corporation
MP13	*OCR Complaint Data*	Milford Point School Corporation
MP14	*Middle School Accessibility Report & Analytics*	Milford Point School Corporation
MP15	*Questions to Ask an Accessibility Consultant*	Milford Point School Corporation

Appendix E

List of Focused Codes

Addressing accessibility at individual level
Being aware of potential accessibility barriers
Building accessibility capacity within the LEA
Building accessibility knowledge from scratch
Campaigning for accessibility from the grassroots
Communicating district policy
Confronting challenges in accessibility work
Coping with inaccessible technology
Crusading for accessibility
Deterring the worth of accessibility
Doing accessibility for disabled people
Doing accessibility with disabled people
Identifying policy actors
Implementing instructional technology/resource
Learning about accessibility
Learning about accessibility policy
Making a commitment to accessibility
Making LEA policy
Making meaning of accessibility
Managing competing priorities
Managing website within LEA
Navigating state policy landscape
Negotiating responsibility for needs of disabled kids
Procuring instructional technology/resources
Reacting to OCR letter initially
Realizing additional benefits of addressing accessibility
Responding to OCR letter
Striving for but struggling to attain 100% accessibility
Struggling to interpret accessibility policy
Tracking progress towards accessibility goals
Working on accessibility of website
Working with vendors

Appendix F

Sample Memos

Analytic Memo Example: MB 2019.01.04 Process Definitions and Explanations

This memo is going to be the home of the definitions for the different parts of the

process map as it currently stands.

What work is involved in enactment and iteration. The vast majority of the

accessibility policy enactment work that is occurring in the LEAs is related to the district-

level web presence. However, there is evidence of the accessibility policy enactment

process spreading to other aspects of LEA work. The spread of accessibility policy

enactment to other aspects of LEA work is seen in iterations of the process, but is never

part of the initial work. Examples of the expansion of accessibility policy enactment

include: external digital documents (parent communication, news letters), instructional

materials, internal documents, building and teacher level websites, etc.

Shifting from reactive to proactive. Most of the LEAs start off addressing

accessibility in a reactive way. When an LEA is addressing accessibility reactively it

means they are only dealing with accessibility issues after someone has brought an issue

to their attention. For example, a blind student moves into the district and can't access the

math software so the LEA deals with accessibility (reactive). Overtime, there is a shift in

the LEAs in how they address accessibility. The shift is from a reactive approach to a

proactive approach. LEAs that are addressing accessibility proactively are addressing

accessibility in various aspects of their work from the jump. However, and LEA could be

addressing accessibility proactively in one area and still addressing accessibility

reactively in another area. Addressing accessibility proactively includes: creating born-

accessible materials, buying born-accessible materials, integrating accessibility

considerations into your daily practice, and making a commitment to accessibility.

Perhaps the deepest level of a proactive approach, maybe it's even a step past a proactive

approach, is to have a culture of accessibility.

Informing. When an LEA's engagement in one category of work in the process

shapes its work in another category in a way that is meaningful but not so drastic as to

expand the scope of existing work or add a new kind of work (more dramatic changes in

the work are considered iterations). For example, if an LEA has decided that it will

remediate the accessibility errors discovered in the initial accessibility evaluation and so

they have been going through and writing alt tags for all the images on their website.

After doing some alt tags they happen to learn that the content of the tag is really

important and they realize many of the alt tags they've written are not meaningful and

thus need to be rewritten. That is iteration because what they learned about alt tags

shaped their practice going forward, but it did not substantively expand the nature of the

work. Following are additional examples of *informing*.

- Learning → Strategizing: When you learn about policy, it can inform how you

  strategize (you might decide to just work to pass the test). As you learn more

  about accessibility, it may change how you choose to approach accessibility

  (might decide to broaden your approach in some way). Through learning you may

  figure out what needs to be in your plan or policy. After deciding you need a plan

  of action, to develop it you might decide to go learn about best practices and then

  what you learn informs your course of action.

- Strategizing → Learning: Your plan of action might indicate what learning needs to occur explicitly or implicitly (if you need to do X, Y, and Z kinds of work and you don't know how to do them, then you are going to have to learn about them).

- Strategizing → Practicing: You aren't going to start practicing until you've decided to start working on accessibility. The policy you develop may (in some ways) dictate what some of your practice looks like (particularly policy enforcement work).

- Practicing → Strategizing: Through practice, you often operationalize the strategy (what exactly does it look like to conduct regular audits and remediate identified issues?). By practicing you may learn that the strategy needs to be different (the plan of action is incomplete, the policy needs work) or you need to add some additional work or otherwise expand what you are doing (iterating).

- Practicing → Learning: Through practice you discover what things you still need to learn or better understand and then you set out to learn those things. Through practice you might figure out who needs to learn, too (not just what).

- Learning → Practicing: When you start off knowing almost nothing, the first thing you have to do is learn, and then what you learn determines how you practice (how you remediate a specific issue). Learning to practicing is probably the place where the greatest amount of informing occurs and vice versa.

Trend line. The trend line represents the generalized trajectory of a given LEA's technology accessibility enactment process. The actual trajectory when looked at in detail is far from a straight line; it will have ups and downs.

Infinity. The infinity symbol indicates that the enactment process is never done. Accessibility is something that LEAs have to always be attending to (both from my perspective and theirs). Accessibility enactment is never done because: technology that the LEAs already has changes over time in either content or interface (website, software updates); LEAs adopt new technology that has to be examined for accessibility; the standards are updated regularly, which can precipitate changes in the enactment of accessibility.

Becoming aware. LEAs become aware of accessibility policy when they first learn about it. They may have been aware of accessibility as a construct prior, but they did not know that it was a legal requirement. All of the LEAs became aware of accessibility policy as a result of legal action. Just because the LEA is aware of the accessibility policy does not necessarily mean they know exactly what the policy is. They may just know that they are legally obligated to do accessibility.

Challenge. A challenge is an aspect of the work that is difficult for LEAs or an aspect of their context that makes accessibility work challenging to carry out. For example, interpreting accessibility policy is sometimes a challenge for LEAs because they get different information from different sources about what the accessibility policy means. Challenges are likely also decelerators; but decelerators are not by default challenges. The government deciding not to pay attention to accessibility anymore, for example, could be a decelerator, but would not be a challenge for LEAs.

Accelerator. Things that speed up LEAs' progress towards their accessibility goals. Or things that speed up LEAs' technology accessibility policy enactment process. This concept is connected to the ebb and flow of the work.

Decelerators. Things that slow LEAs' progress towards their accessibility goal. Or things that slow LEAs' technology accessibility policy enactment process. This concept is connected to the ebb and flow of the work.

Iteration. I am going to try to write through what is iteration in this process. The two versions of the definition that I came to through writing are:

1. Iteration is a step in the evolution of an LEA's accessibility policy enactment process that serves to move the LEA closer and closer to their policy ideal by continually retranslating policy into local practice. LEAs iterate their process by either adding a new type of substantive work or by expanding the scope of work in an area in a substantive way. Iterations occur organically as a result of the LEA's engagement with the enactment process rather than as a stage in a pre-scripted plan. Examples of iteration include: Mount Elison expanding their auditing/remediation work from the district site to all websites under the LEA purview, and Mount Elison adding a new kind of work to their process by developing a formalized policy and communicating it on their website.

2. LEAs move closer and closer toward the policy ideal by translating policy into local practice through successive iteration. Iterations occur organically as a result of the LEA's engagement with the enactment process, rather than as a stage in a pre-scripted plan. LEAs iterate their enactment by either adding a new type of substantive work or expanding the scope of work in an area in a substantive way.

I'm looking back at the visual maps of each LEA's process that I drew back on December 31, 2018, and those I marked in green where I thought iteration occurred.

Strategizing. In this piece of the process, LEAs are making fairly big-picture decisions about how the LEA is going to approach accessibility. This level of decision

includes things like: are we going to address accessibility, what is our plan of attack with respect to addressing accessibility, what resources will we devote to addressing accessibility, how big of a priority is accessibility for our LEA (how do we fit accessibility into our existing priorities, how much worth/value do we put on accessibility), what policies will we put in place (if any), what are our goals and benchmarks for this work, who will be responsible for this work. There is also an aspect of gathering data, such as: where exactly are we now with respect to accessibility on our website, what do other LEA policies look like, what do our existing policies around the website look like. This aspect of the process is more about talking and thinking, a bit less active; it can also be about pulling together various stakeholders, though it is not always that multi-disciplinary.

Learning. Developing knowledge about accessibility. One might learn by going to a training or Googling stuff. But there is an intentional time of trying to develop knowledge of accessibility and accessibility policy.

Practicing. Practicing accessibility is about taking what you have learned about accessibility and accessibility policy and translating that into local practice. It's also about taking any strategies or plans related to accessibility that the LEA has developed and iteratively operationalizing them through practice. We plan to do regular audits, but how do we actually carry that out, what does it look like. Through practice, LEAs clear up/define any ambiguous aspects of accessibility policy and LEA plans. In order to act on a policy or plan you have to decide what it means and how to "do it" if that is not already spelled out in the policy/plan, or if it is, how exactly you are going to do what is spelled out in the plan in your particular context.

OCR says they want you to do regular audits and your LEA's plan says you are going to do regular accessibility audits, but how often is "regular"? And how robust are the audits? The law says your website should be accessible and you've decided as a district that you want your website to be accessible, but what parts of the website? The whole website? And how are you going to ensure your website is accessible? OCR seems to say that inaccessible third-party content that is linked from your website is also problematic. So are you just not going to link to third-party stuff, or are you going to deal with it in some other way?

Some of these decisions are made through planning and others are made through practice (seeing what actually works and is pragmatic in the context). Practicing is also about just doing the work. Practicing is a very active piece of the process. A piece of practice is also about spreading the word about accessibility and championing it within the LEA: campaigning for accessibility, building capacity, communicating LEA policy, etc. Perhaps the amount of translating that occurs during the practicing parts of the process is dependent on the level of strategizing the district has done. It is easier to put accessibility into practice if the LEA has defined what accessibility looks like to them already. When the LEA has defined what success means, it is easier for those tasked with doing the work to know what needs to be done and to track their progress towards that goal. When the LEA has not defined what success means, then it is harder to put accessibility into practice because there is ambiguity around expectations. The ambiguity ends up being worked out through the actual practice (those doing the work decide what accessibility means to the district) but they still might be left a bit uncertain as to whether or not they have achieved the goal.

Related memo(s). MB 2018.12.07 The Process Visual and Explanation &

Evolution

Reflexivity Memo Example: RJ 2018.02.28 Chromebooks

As I am reading through interview transcripts, Chromebooks have come up a

handful of times. I need to note that I do not like Chromebooks. Historically, the

accessibility of Chromebooks has been terrible. I was a beta tester for the original version

of ChromeVox (the screen reader for the Chromebook) and it was terrible. The

accessibility of Chromebooks is getting better, I hear, but there is plenty of room for

improvement. It frustrates me that so many of the schools are using Chromebooks since

accessibility is iffy at best.

The fact that Chromebooks are so cheap (districts can probably even get them for

free) is the reason they are so ubiquitous; one participant even said as much. I understand

the economic advantage, but what about disabled kids? So the cost of the product drives

the decision and accessibility is either not considered or maybe it is sacrificed to take

advantage of the low cost? Or the price point is more important than the ability of all kids

to use the technology?

Methodological Memo Example: MJ 2018.11.14 Focused Coding

This memo describes how I carried out focused coding.

I first pulled key initial codes out of NVivo (there were over 600 initial codes).

Specifically, I looked at the initial codes that were used the most. I also looked at the

initial codes that overlapped with the "quotable" code, which identified key passages in

the data. The codes that overlapped with the "quotable" code also had importance in the

data, though they may not have been used as frequently.

I dumped all of the initial codes I pulled from NVivo into a Scapple file. Those codes are still in Scapple in a box labeled "Initial Codes from NV." Next, I looked at those initial codes and started trying to group them based on what seemed to go together based on my knowledge of the data.

After I had all of the codes grouped, I went through and looked at each group. To look at each group, I pulled up all the initial codes I had in that group in NVivo. Then I went through and read each data point that was coded under each code. In doing this, I was comparing each data point to the code and each code to the other codes in the group as well as to the group as a whole. Through this constant comparison I was able to determine whether the data points still fit that code, whether the code fit the group, what a good focused code name for the group might be, and if a code was better suited under another group.

After looking at all the codes in a group, I rearranged the codes and groups in the Scapple file. During constant comparison, if I determined that a code did not fit the group and actually fit another group better, I moved it. If I just knew it didn't fit the group, but didn't know where it went, it went back to the "ungrouped pile." If I decided to rename a group, then I renamed it in Scapple.

Sometimes after looking at all the codes in a group and doing the constant comparison, I would wonder if I got all the relevant codes for that group or if there might be more. In those instances, I then skimmed through the initial codes in NVivo (more codes than what were listed in Scapple) and if I saw some codes that I thought might fit the group, I pulled that data and did constant comparison on that to see if it fit the group. Sometimes those additional codes fit the group and sometimes they did not. Sometimes I

thought they might fit another group better. So then I added that code to the appropriate group in Scapple, to be checked later for relevancy.

I saved a PDF of the Scapple file at the end of each data analysis session so that later I could see the progression from the original file to the final file and go back and look at each step if I needed to.

These groups I created are focused codes, and some of them will probably be elevated to theoretical categories later in data analysis.

Related memo(s). MJ 2018.10.04 Moving Forward Theoretical Sampling and Focused Coding

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Shaheen, N. L., & Lohnes Watulak, S. (2019). Bringing disability into the discussion: Examining technology accessibility as an equity concern in the field of instructional technology. *Journal of Research on Technology in Education*. *51*(1), 187–201. doi: https://doi.org/10.1080/15391523.2019.1566037

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U.S. Department of Justice New Construction & Alterations Rule, 28 C.F.R. § 35-151

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U.S. Department of Justice Nondiscrimination on the Basis of Disability in State and

    Local Government Services, Communications Rule, 28 C.F.R. § 35.160 (2019)

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accounts for dis/ability. *Harvard Educational Review*, *86*(3), 366–389.

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    retardation in general education classrooms. *Exceptional Children*, *72*(3), 347–

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    northwest U.S. K-12 schools. *Educational Technology & Society*, *10*(3), 222–232.

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NATALIE L. SHAHEEN

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EDUCATION

2019   **Ed.D. in Instructional Technology**

Towson University, Towson, MD

Dissertation title: The Five Elements of Technology Accessibility Policy Enactment in K-12: A Grounded Theory

2007   **M.Ed. in Blindness and Visual Impairment**

The Ohio State University, Columbus, OH

2006   **B.S.Ed. in Special Education**

Ohio University, Athens, OH

PROFESSIONAL APPOINTMENTS AND EXPERIENCE

2019–Present **Assistant Professor of Special Education**
Illinois State University, Normal, IL

Teach courses in assistive technology, blindness and low vision, and special education.

2017–Present **Project Director**
Spatial Ability and Blind Engineering Research Project
National Science Foundation grant no. 1712887, $2.09 million, 5 years

Manage the budget, ensure deliverables are met, collaborate with the team to conduct and publish research, design and facilitate STEM programs for youth grades 9-12

2013–2017   **Project Director**
National Center for Blind Youth in Science
National Science Foundation grant no. 1322855, $1.5 million, 3 years

Managed the budget, collaborated with the team to conduct research, collaborated with 6 science museums to improve accessibility, ran 11 STEM programs for youth grades 3–12, ran 3 STEM-focused inservice teacher workshops and 6 parent workshops

2011–2015   **Director of Education**
National Federation of the Blind, Baltimore, MD

Led a team of five, managed a $500,000 annual budget, ran over 20 STEM and literacy programs serving thousands of youth age 3–21,

served as a consultant to dozens of K-12 and post-secondary institutions on the topics of blindness and STEM education

2009–2011 **Education Program Specialist**
National Federation of the Blind, Baltimore, MD

Directed a Braille literacy program for youth ages 4–12 and increased the youth served by 20-fold, designed and facilitated middle school social studies programs that fostered civic engagement, designed and facilitated multi-disciplinary STEM programs for youth in grades 3–12

2008–2009 **Teacher of the Visually Impaired**,
Indiana School for the Blind and Visually Impaired, Indianapolis, IN

Fifth grade classroom teacher for blind youth with autism, conducted functional behavior assessments and implemented behavior intervention plans, created accessible and developmentally appropriate materials for literacy and math instruction

2007–2008 **Teacher of the Visually Impaired**
Clark County School District, Las Vegas, NV

Itinerant teacher for 35 blind and low-vision students age 3–21, taught assistive technology and Braille, conducted functional vision and learning media assessments, collaborated with general education teachers to create inclusive classrooms, created accessible instructional materials

2006–2007 **Classroom Special Education Teacher**
Oakstone Community School, Columbus, OH

Taught math and language arts to K-6 students with autism, conducted functional behavior assessments and implemented behavior intervention plans, wrote and managed individualized education programs

PUBLICATIONS

Refereed Publications

2019 Goodridge, W. H., **Shaheen, N. L.**, & Bartholomew, S. (under review). Teaching technology & engineering concepts through socially relevant contexts: Adapting older engineering graphics methods to facilitate new opportunities in our school systems for blind and low vision youth. *Technology and Engineering Teacher*.

2019 **Shaheen, N. L.**, & Lohnes Watulak, S. (2019). Bringing disability into the discussion: Examining technology accessibility as an equity concern in the field of instructional technology. *Journal of Research on Technology in Education*. *51*(1), 187–201. doi: https://doi.org/10.1080/15391523.2019.1566037

2018 Farrand, K. M., **Shaheen, N. L.**, Wild, T., Averil, J., & Fast, D. (2018). Improving student self-efficacy: The role of inclusive and innovative out of school programming for students with blindness and visual

impairments. *The Journal of Blindness Innovation and Research, 8*(2). Retrieved from https://nfb.org/jbir

2018 **Shaheen, N. L.**, & Lazar, J. (2018). K-12 technology accessibility: The message from state governments. *The Journal of Special Education Technology*, *33*(2), 83-97. doi:10.1177%2F0162643417734557

2016 Wojton, M. A., Heimlich, J., & **Shaheen, N. L.** (2016). Accommodating blind learners helps all learners. *Journal of Museum Education*, *41*(1), 59-65. doi: 10.1080/10598650.2015.1126150

2013 **Shaheen, N. L.** (2013). #BrlChat: Free professional development from the comfort of your home! *Division of Visual Impairments Quarterly*, *58*(4), 18-23. Retrieved from http://community.cec.sped.org/dvi/publications

Non-Refereed Publications

2016 **Shaheen, N. L.** (2016). The National Center for Blind Youth In Science: Increasing blind people's access to informal STEM learning opportunities. *Future Reflections*, *35*(2).

2014 **Shaheen, N. L.** (2014). Science, technology, engineering, and math to the extreme. *Future Reflections*, *33*(1), 32-35.

2013 **Shaheen, N. L.** (2013). The 2012 Braille symposium providing high-quality Braille instruction to blind children and adults. *Braille Monitor*, *56*(2), 91-94.

2012 **Shaheen, N. L.** (2012). Charting our own course NFB project innovation. *Braille Monitor*, *55*(9), 792-804.

2011 **Shaheen, N. L.** (2011). Driving change: The 2011 NFB Youth Slam. *Braille Monitor*, *54*(10), 836-849.

2011 **Shaheen, N. L.**, Otwell, J., (2011). One summer, fifty blind children, five states, and six BELLs. *Braille Monitor*, *54*(1), 7-9.

2011 **Shaheen, N. L.** (2011). Braille readers are leaders 2010-2011. *Future Reflections*, *30*(3), 51-53.

2010 **Shaheen, N. L.** (2010). Ringing a BELL for Braille literacy. *Braille Monitor*, *53*(1), 59-61.

2010 **Shaheen, N. L.** (2010). Leading the Way: The 2009-2010 Braille Readers Are Leaders Contest. *Future Reflections*, *29*(3), 55-58.

2010 **Shaheen, N. L.** (2010). Without exception: Teaching the skills of blindness to children with additional disabilities. *Future Reflections*, *29*(2), 6-8.

AWARDS AND FELLOWSHIPS

2017	**President's Diversity and Inclusion Award**
	Towson University, Towson, MD
2017	**Terminal Degree Fellowship**
	Towson University, Towson, MD
2013	**New Leader Award and Hall of Fame Induction**
	The Ohio State University, Columbus, OH

GRANTS

2019	Renoe, S. D., Tubon, T., **Shaheen, N. L.** (2019). Workshop: Broadening participation of persons with disabilities in STEM, October 14–16 2019, National Federation for the Blind, Baltimore, MD. National Science Foundation grant no. 1940655, $49,748, 1 year.
2019	Lewis, A., **Shaheen, N. L.** (2019). National Federation of the Blind STEM2U. General Motors grant no. 54720007, $118,010.45, 1 year.
2017	Lewis, A., Goodridge, W. H., **Shaheen, N. L.** (2017). Spatial Ability and Blind Engineering Research Project. National Science Foundation grant no. 1712887, $2.09 million, 5 years.
2013	Riccobono, M., Wild, T., Reich, C., **Shaheen, N. L.** (2013). National Center for Blind Youth in Science. National Science Foundation grant no. 1322855, $1.5 million, 3 years

INVITED PRESENTATIONS

2019	**Shaheen, N. L.**, Goodridge, W. H. (2019). Education, research, and raising expectations: Exploring spatial abilities and training blind engineers. Plenary session presented at the *National Convention of the National Federation of the Blind*. Las Vegas, NV.
2018	McSorley, J., **Shaheen, N. L.**, & Krevor-Weisbaum, S. (2018). Pushing the needle forward on K-12 accessibility. Preconference session presented at *AccessU*. Austin, TX.
2016	**Shaheen, N. L.**, Heimlich, J., & Hammond, F. (2016). A community of practice: The Federation in science, technology, engineering, art, and math. Plenary session presented at the *National Convention of the National Federation of the Blind*. Orlando, FL.
2015	**Shaheen, N. L.** (2015). Without exception: Skills for today's classroom and tomorrow's world. Keynote address to the *National Federation of the Blind of Illinois Teacher, Parent, and Student Conference*. Chicago, IL.
2014	**Shaheen, N. L.** (2014). Success: The advice I never received. Keynote address at *Empowering Blind Students in Science and Engineering: A*

Professional Development Workshop for Blind Students in Science and Engineering. Seattle, WA.

2013   Chakraborty, J., **Shaheen, N. L.**, & Mason, A. (2013). Accessibility and its application to game design. Talk presented at the *Baltimore Independent Game Seminar*. Baltimore, MD.

2013   **Shaheen, N. L.** (2013). The National Federation of the Blind: The cornerstone of a great professional learning network. Talk presented at the *National Federation of the Blind of Nevada Student Seminar*. Las Vegas, NV.

2013   **Shaheen, N. L.**, Whittle, J., Peret, M., Blake, L., Simpson, M., Martinez, L., & DeWall, G. (2013). The poetry of motion, the grace of movement, the delight of physical expression: Blindness no barrier. Plenary session presentation at the *National Convention of the National Federation of the Blind*. Orlando, FL.

2012   **Shaheen, N. L.** (2012). Twitter: A tool for teachers. Presentation at the *National Federation of the Blind Teacher Leader Seminar*. Baltimore, MD.

REFEREED CONFERENCE PRESENTATIONS

2020   Goodridge, W. H., **Shaheen, N. L.**, Cunningham, A. (2020). Tactile drawing methods to teach engineering graphics to blind and low vision students. Workshop to be presented at *the 82nd Annual International Technology and Engineering Educators Associations Conference*, Baltimore, MD..

2019   **Shaheen, N. L.** (under review). Conceptualizing Access: Technology-Enhanced K-12 Education and Disabled Students. Paper submitted for presentation at the *American Educational Research Association's 2020 Annual Meeting*.

2019   Lopez, S. E., Goodridge, W. H., Gougler; I., Kane, D., & **Shaheen, N. L.** (under review). Preliminary validation of a spatial ability instrument for the blind and low vision. Paper submitted for presentation at the *American Educational Research Association's 2020 Annual Meeting*.

2019   **Shaheen, N. L.**, & Lohnes Watulak, S. (2019). From liability to opportunity: Ensuring web accessibility through technology leadership and teacher education. Paper presented at the *Society for Information Technology and Teacher Education International Conference*, Las Vegas, NV.

2018   **Shaheen, N. L.**, & Lohnes Watulak, S. (2018). Technology accessibility: A social justice concern for K-12 instructional technology and teacher education. Paper presented at the *Society for Information Technology and Teacher Education International Conference*, Alexandria, VA.

2018	Ashby, T., Goodridge, W. H., Call, B. J., Lopez, S. E., **Shaheen, N. L.**, (2018). Adaptation of the Mental Cutting Test for use among the blind or visually impaired. Paper presented at the *American Society of Engineering Education Zone IV Conference*, Boulder, CO.
2015	**Shaheen, N. L.** (2016). Access to the curriculum through mainstream and assistive technologies. Paper presented at the *World Blind Union-International Council for Education of People with Visual Impairment Joint Assembly*. Orlando, FL
2014	Krevor-Weisbaum, S., **Shaheen, N. L.**, Wesler, J. (2014). Advances in blindness advocacy: Power tools in the toolbox. Paper presented at the *Council of Parent Attorneys and Advocates 16th Annual Conference*. Baltimore, MD.

WORKSHOPS AND GUEST LECTURES

2018	Equity and access in instructional technology Towson University, guest lecture, doctoral instructional technology class
2016–2018	Video description: Blind people as consumers and producers of media Towson University, guest lecture, undergraduate disability studies class
2016–2018	Blindness: An introduction Johns Hopkins University, guest lecture, undergraduate neuroscience class
2017	Technology accessibility and change Towson University, facilitator of online learning module, doctoral educational leadership class
2017	Collaborating with parents Towson University, guest lecture, graduate special education class
2015–2017	Blind students as learners Towson University, guest lecture, graduate special education class
2016	Making STEM Accessible National Federation of the Blind, organizer and facilitator, four-day inservice teacher professional development workshop
2015–2016	Baltimore Global Accessibility Awareness Day Seminar Organizer and facilitator, annual workshop for administrators and technologists
2015	Individualized Education Program Advocacy National Federation of the Blind of Virginia, organizer and facilitator, one-day parent and advocate workshop
2015	The blind child: Ages and stages National Federation of the Blind, facilitator, parent workshop
2012–2015	Blind students as learners University of Maryland, guest lecture, undergraduate special education

class

2012–2014	#BrlChat: A Twitter chat for teachers of the blind Founder and moderator, monthly inservice teacher professional development
2013	Blind students as twenty-first century learners Maryland Department of Education, facilitator, inservice teacher professional development workshop
2012	Teacher Leader Seminar National Federation of the Blind, organizer and facilitator, three-day inservice teacher professional development workshop

TEACHING

2019	**Assistive Technology for Individuals with Visual Impairments,** Illinois State University
2019	**The Exceptional Learner**, Illinois State University
2019	**Action Research in Special Education (graduate-level)**, Towson University

PROFESSIONAL SERVICE

2019–Present	**Member**, National Federation of the Blind's Committee for the Advancement and Promotion of Braille
2018–Present	**Reviewer**, *International Journal of Information and Learning Technology*
2018–Present	**Reviewer**, *Journal of Research on Technology in Education*
2017–Present	**Member**, National Federation of the Blind Research Advisory Counsel, Baltimore, MD
2017	**Member**, Maryland State Leadership Team for Accessible Educational Materials Best Practices, Baltimore, MD
2016–2017	**Guest Blogger**, *Kennedy Krieger Linking Research to Classroom Blog*, Baltimore, MD
2012	**Symposia Organizer**, National Federation of the Blind Braille Symposium, Baltimore, MD

LICENSURE

2018–2028	Intense Intervention State of Indiana teaching license
2018–2028	Mild Intervention

State of Indiana teaching license

2018–2028   Blind and Low Vision
             State of Indiana teaching license

PROFESSIONAL AFFILIATION

American Educational Research Association
Counsel for Exceptional Children
Society for Disability Studies
Society for Information Technology and Teacher Education