

5

Schools and Formal Learning Organizations

As much as educational experts might espouse the need for divergent thinking and creativity, a quick skim of popular science fiction and fantasy reveals how fixed our notions of schools and classrooms remain. With only a few exceptions that resist Western notions of schooling models (Okorafor's *Akata Witch* is a particularly useful young adult example), the majority of classrooms and teaching models in alternative worlds or in far-flung galaxies look remarkably like what twentieth-century classrooms look like. These models—derived from medieval Western notions of how universities and formal schools might operate—are relatively new when looking at the timescales of human development and progress. Our relationships with land, with preprint forms of oral literacy, and with guild-like models of apprenticeship have been fundamental forms of schooling eons before “schools” and degrees and Carnegie units ever came into existence. In the same way that we might think expansively about where and how individuals are clustered when it comes to data collection, how we orient student bodies, learning, and instruction has largely been cordoned off to familiar repertoires. Watch children frolicking at a nearby playground, and you’ll see organic forms of teaching and

learning that elide schooling structures that will be encountered later in those children's lives.

As our reflection on *Star Trek* and assessment illuminated in the previous chapter, despite our imaginative descriptions of advanced technologies, magical flora and fauna, and alternate ways of living with more-than-human life, our relationship to learning remains grounded in the terrestrial notions of drill-and-kill high-stakes assessment. And while we might love the idea of moving beyond the unimaginative land of formal learning organizations, we are also all too familiar with the fact that these are the pragmatic spaces to which our work as researchers must attend. With this in mind, we ask you to imagine this chapter's emphasis on deliberate approaches to schooling and data in contrast with the world of schooling *as it could be*. Like a frenzied puppy seeking the stuffing-filled innards of a chew toy, excavate the principles of schooling here and connect with their squeaking, regimented heart. In this way, this chapter offers our first "deep dive" into a context: appropriately, that of schools and other formal learning organizations. We use AnSpec to look at how identity is used as both a tool and a weapon and how AnSpec can help us see where we can improve schools without selling our children's data or dehumanizing them. We also give examples from prospective futures—science fiction in particular—to understand and explore possibilities of schools as a space for resistance.

What Are Schools?

Let us start with the basic premise of this book again: freedom and justice are the ultimate goals of critical use of data in educational research. Recognizing this, we need a clear-eyed understanding of exactly what we are dealing with in schools. From individual student learning metrics to data driving large-scale decision-making, the ways information flows through and shapes schooling contexts is

pervasive and never neutral. What are the creative possibilities made available to students and their teachers daily? How does data shape and stifle? Because this chapter focuses on how data is used and *could be* used in formal schooling settings, we start with a substantive dive into the purpose of schools in the US today. Reviewing the vocational, civic, and social purposes of schools and what they do on a day-to-day basis allows us to understand where data lives and what it does.

Because most of the readers of this book have spent substantial portions of their lives in some form of school at some point, our imagination of what schools look like and feel like may be a bit constrained and inflexible. Sure, the names of classes, the schedules, and the instructional approaches may get the occasional facelift, but as an 8:00-3:00(ish) daily operation that separates students by age and moves them from room to room, a Western model of schooling can feel rigid. We share this to highlight that perhaps the most limiting aspect for how we might imagine (and continually *reimagine*) schools is the fact that we have a collective, shared vision of what schools feel like, what they are supposed to do, and how they are supposed to generally operate on a day-by-day, hour-by-hour basis. Despite this, we know that schools are neither limited to such narrow aims, nor are they shaped in only this way. In fact, some of the things we take for granted about schools and their operation might be insidiously harmful (even if/when they are invisible). For example, most people reading this book (at least in US contexts) might assume that schools *should* be built around several existing criteria:

- a “Carnegie” system of grading (e.g., units and A-F grading);
- students engaging in separate and distinct disciplinary subjects; and
- placing students with peers who are around the same age.

This list reflects the tacit ways in which most people would probably describe what schools do. They are the “grammar” of schooling

as described by Tyack and Cuban (1995). Yet, none of these elements of schooling are tied concretely to student success, much less broadening equitable college and career outcomes for all students or furthering a freer vision of democracy in this country. Rather, these are the systems that our society adopted and adapted while moving toward industrialization more than a hundred years ago.

In our push for a more thoughtful and playful understanding of what justice-driven visions of schooling and data-use within schools could be, we point to these apparent immutable laws of public schooling as the general boundaries of societal imagination. We acknowledge that it is hard to imagine schools today that do not align with these components, yet that is precisely what a speculative approach to justice enables. To understand what we *could* be as participants in educational systems, we want to ground the first part of this chapter in a basic question: “What are schools actually for?”

Perhaps most cynically, schools are a relatively safe place to keep children occupied during the typical workday. The COVID-19 pandemic’s widespread impact in 2020 and 2021 made most explicit to harried parents across the US just how valuable schools are as spaces for “containing” and caring for students daily. This perspective of schools as sites of ongoing infant to near-adult daycare is not usually addressed in educational research, but we name it here to specifically illuminate at least one basic way in which schools function societally. There are historical precedents for this as well. An increase in humane child labor laws in the early 1900s meant that adults needed to seek places to keep children during “regular” working hours. These larger shifts in industrialization moved in parallel to the adaptation of schools from one-room schoolhouses to comprehensive school systems within burgeoning cities nationwide.

This shift illustrates how labor and US citizens’ relationship to it have been the guiding forces for how schools are designed and operated since their inception. To follow this trend, alongside relieving working-class adults of childcare needs, schools have been imbued

with the expectation of preparing young people for the labor market. The idea of “vocation as an aspect of how schools function as part of a larger sociopolitical system” has wide-reaching implications for data collection and analysis, as we explore later in this chapter. One of the schools that Antero taught in as a high-school English teacher was Manual Arts High School, one of the oldest high schools in Los Angeles. We draw particular attention to the name of the school; the “manual arts” of the school name were specifically tied to the labor and factory work that was eventually taken up by predominantly Black and (later) Latinx communities living in South Central Los Angeles throughout the twentieth century and beyond. At sporting events, the school’s mascot, Tommy the Toiler, would wield a large fake sledgehammer, reinforcing the message that this is a school for hard-working (e.g., “toiling”) laborers.

From vocational work and skilled labor preparation to a decades-long emphasis on “college and career readiness” (Pimentel, 2013), the language that describes the necessity of vocational training in this country changes even when the purpose remains the same. We do not mean to say that labor and preparing for it are bad! We recognize several substantial and important ways that these skills are fundamental aspects of learning and society (Rose, 2005). It is not, however, the *only* purpose of schooling.

Just as a US economy depends on skilled workers to thrive, so too does its democracy depend on enthusiastic and competent civic actors. In this sense, another key purpose of schooling is to guide students into civic participation in the social world that beckons to them from beyond the walls of the classroom. From understanding the existing mechanisms of government and politics, to learning to advocate, to understanding how to organize for social good, one role of schools is to instill in students “participatory readiness” (Allen, 2016). Ironically, this purpose has become an almost subversive antidote to consistent measurement, as “citizenship” is itself inconsistent (and, therefore, hard to gauge consistently; Mirra & Garcia, 2020).

Just as the language of vocational training updates from one generation to the next, the emphasis of what civic learning looks like in schools also shifts. Best practices today emphasize curricula that are variously *authentic* and *relevant*. This language signals connections to culture and to the world beyond classrooms and offers important links to the racial and socioeconomic backgrounds of students. This language is also remarkably like language from more than a century ago. Dewey (1899) describes a democratic approach to schooling that sounds remarkably like calls for “twenty-first-century learning” today. The US has been on a perpetual quest to ensure that schools are relevant and mirror the needs and interests of engaging in contemporary society. Ask most students, teachers, administrators, parents, and policymakers and you would be hard pressed to find someone who does not voice a commitment to making schools relevant and meaningful bastions for engagement in the world beyond the classroom. This is a wholly valid and important push for schooling. However, it is a quest that schools have systematically failed at achieving for more than a century.

Today, this infatuation with relevance is called “twenty-first-century learning.” In work with Mirra (Mirra & Garcia, 2020), Antero engaged in a systematic exploration of what twenty-first-century learning actually means or looks like in US research contexts. The results of this work were damning. When we talk about “twenty-first-century learning” in educational research, we frankly don’t know what we are talking about or have a unified vision of what this means. It is from this murky demand for *something* that a wellspring of data-informed disruptions, innovations, and additions to student learning spouts today. In a perpetual quest to fix schools, we have sought creative, relevant, and authentic solutions generated by technology and data-driven platforms (rather than, say, participants). In looking at how this has happened and what it does to schools, we frame the later part of this chapter around what it might mean to

reverse this trend and invest financially, emotionally, and intellectually in the possibilities of young people.

Data and Schooling

Schooling data proliferates. Throughout the different models of schooling described earlier in this chapter, data sorts and guides students and their learning experiences. In myriad ways, students are academically and physically guided toward specific outcomes. Data is at the heart of these decisions, but where that data comes from, what its predetermined purposes are, and toward what overarching ends it is aimed are often occluded from students, parents, and teachers. For example, data has interesting interactions with the notion of schools as preparation for and support of labor. Effectively, the entire research base in education, vocational/business studies, and the learning sciences suggests that students will be best prepared for authentic labor if they are authentically engaged in related material. It is clear that very little of a typical high school student's day engages in authentic labor or production. Indeed, very little of the data that schools generate is about supporting any of their arguable goals, and almost none (if any) of the data they generate is useful to them or even corporations (other than those corporations that want to exploit the structure of school itself, such as textbook and curriculum companies, for example). This is curious, though, as almost all stakeholders—students, parents, teachers, administrators, policymakers, politicians, corporations—would almost certainly value a stream of data about students engaging in authentic tasks. The reasons are clear: consistency and identifiability. Schools have come to value consistency and identifiability of data over the value of the data itself. Though it is clear to everyone involved (especially teachers) that students learn much less when quizzed multiple times a week, many students are

still quizzed multiple times a week in multiple classes as a way for the structures of schooling (and school funding) to regularize, validate, and internally reconcile their Identifiable Individualized (IH) data.

The number of data streams in schools has only grown in recent years. They are a confluence of flowing information about students, about teachers, and about the metrics that various corporate institutions seek that flows *away* from individuals and into the shallows of businesses. Though data has always informed schooling decisions (and kids have been taking quizzes in classes on a daily basis—to the chagrin of nearly all involved—for generations), the sheer amount of data amassed about students today has led some to refer to this process as the “datafication of education” (Jarke & Breiter, 2019; Williamson, 2019). Test scores are one obvious form of data that are likely understood and assumed by most readers. Though parents and teachers may see test scores at individual and identifiable scales, they serve fundamental sorting and budgetary roles at higher scales. Infamously, the 1983 report, *A Nation at Risk*, opened with the foreboding words, “If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves” (National Commission on Excellence in Education, 1983). This sentiment and the fear-mongering that followed led to ongoing emphasis on test scores and evaluation.

No Child Left Behind, Race to the Top, Every Student Succeeds . . . the names of the various federal initiatives in the 2000s speak to the collective insecurities the USA has placed upon schools about its status and intelligence as a global nation. Our interpretation of data—of the ways we mold and shape young human beings in schools today—is reflected through a lens of capitalist competition. The ethical question underlying these policies has been overlooked for far too long: Is capitalism—and the individual deficit perspectives that it typically reinforces—incompatible with what we want out of schools?

The kinds of demographic information that clues people into the socioeconomic contexts under which a given school operates may also be understood as the kind of data collected. These are forms of data collection that have been going on for decades in the US context, from attendance-tracking systems to online learning management systems that check students' time "engaged" in each set of learning tasks, to eye-tracking software. Currently, these practices are not even necessarily tied to formal academics. From swiping into school facilities to logging on to school-issued devices, the digital footprint left by each student allows schooling systems to track their moment-to-moment lives in myriad contexts.

The prevalence of social media in the lives of students, parents, and teachers today means that even data not intended for the gaze of school officials becomes a part of how schools operate. From online pressure around politicized curriculum like critical race theory to issues of student bullying and privacy, the data streams from content platforms extend far beyond what is assumed to be the traditional boundaries of schools. There are *good* learning opportunities around these differences. For example, educators are considering the porous boundary between the private and closed-off spaces of classrooms and the public nature of writing to an authentic audience (e.g., Lo et al., 2023). These opportunities for engaging in authentic learning extend to models of project-based learning and dated visions of democratic schooling (Dewey, 1903); the promise of social media for engagement is nothing new. Yet, these online tools, too, cause more concern and handwringing than educational innovation. The flows of data were never structured for democratic schooling (Apple, 2004, 2012, 2017).

In early 2021, the Supreme Court ruled in the case of *Mahanoy Area School District v. B.L.* that the school district could not punish young people based on their messaging in out-of-school contexts. Based on a viral message from a teenager shared online, the case was

often shared as a victory on behalf of free speech. However, pertinent to the relationships between schools and data discussed in this chapter, the language of the court does not ring with the promise of freedom. Rather, the ambiguous wording of the ruling allowed schools to potentially regulate forms of off-campus speech in the future, and the ruling generally ignored the modes of data collection and surveillance that have multiplied in today's digitally mediated landscape. Despite allowing this student's words to move beyond the punitive control of a district, this is an instance that feels like a harbinger of how school control and the uses of data will likely move further into most aspects of students' lives.

It is hard to keep track of the myriad kinds of data that flow in, around, and about the lives of young people. Assessing learning metrics, managing behavior, guiding funding decisions, driving policy, standardizing learning expectations, driving social interactions, curtailing physical and digital access to materials, and surveilling young people's actions and bodies: these are basic forms of what data does multiple times every day of students' lives. Bad data and bad interpretations of limited data can lead to historic inequities. The past is a clear indictment. From the Moynihan Report (1965) that blamed Black communities for educational deficits to legacies of scholarship that still today seek to tie measures of intelligence to racial and genetic traits, data are a cudgel for inflicting generational harm on vulnerable communities. Further, how those in power choose to act upon limited kinds of data can only exacerbate the negative impacts of school data. As a 60-year quagmire that continues to rumble forward, for instance, the effects of school desegregation through mandated busing efforts reshaped who made up the teaching profession after *Brown vs. Board of Education*, added thousands of hours of commuting time to the lives of US youth, and remapped where and how schooling transpired in nearly every state (Garcia, 2023). These were data-informed decisions, and their effects continue today, despite the lack

of clear indicators that busing has ever been a “correct” solution to the data of segregation.

We do not write this seeking to abolish data or the mechanisms of capturing it. But we do think we should abolish *bad* uses of data and push scholarly imagination of what data is for and how it is constructed. At the heart of this push, we need to challenge the assumptions of what data is for and how it conceives of young people as a problem.

Constructing and selling youth identities Looking at the prevalence of learning management systems and digital learning platforms in school contexts today, it is clear how these systems function as the infrastructure on which schools operate. Day-to-day decisions about the needs of schools are operationalized by the data collected about students. These data, then, are not measures of many of the components of schooling that were noted at the beginning of this chapter. A student’s inquisitiveness, sense of safety and well-being, joy, or civic development are rarely meaningfully measured.

Further, although the plethora of data here is collected at the individual level, it is interpreted *en masse*. In this way, we use AnSpec to look at how identity is used as both a tool and a weapon and explain how AnSpec can help us see where to improve schools without selling our children’s data or dehumanizing them. Whereas the language of schooling professional development might focus on individual learning plans and customization for student needs, data is typically collated into a valent trend of Identifiable Grouped (IG) and Anonymous Grouped (AG) data to inform decisions. Schools often create aggregations such as “English language learners” and “special education students” to evaluate the variance in data generated by individual students; it is easier to generate good metrics when you create subcategories that are evaluated separately. Though there might be advantages to these groupings, we also want to draw cautious attention to what

is lost at this scale and how grouped data might seem counter to the perspectives and needs of families and well-meaning teachers.

None of the data collection processes described in this chapter are new. For decades, youth identities and their outcomes in schools have been constructed and parsed into lived differences for students long before they ever even enter schools. Approaches to understanding student performance based on socioeconomic markers or even zip code have been in use for years.

In our experiences working with educators, teachers often strive to work in beleaguered conditions in classrooms specifically because of their commitment to bettering the learning opportunities of their students on an individual basis. Great teachers get to know and build meaningful experiences for the students they work with each year. They offer detailed feedback to students and to their guardians. They are seen to operate at an IH level. Our profession *trains* teachers to do this and it is likely in our human nature to do so: the relationality of seeing and empathizing with the learners in our classrooms makes us better able to tailor our instruction to them.

In recent years, however, the wave of data-informed schooling practices has shifted the ways in which many teachers are evaluated. They are evaluated by group progress. Quantitative formulas like Value-Added Models (VAMs) compare student progress from one period to another and collate this data to determine how much “value” individual teachers brought to a group of students. The new pressures of data-imbued measurement tax teachers and, based on our experiences, often make a school’s atmosphere palpably worse.

What is missing in the descriptions of the purposes of schooling discussed earlier is a particular, key population: the students themselves. The varying and sometimes contrasting perspectives of what schools are for fail to account, at an individual level, for who schools are for. For better or worse, this is where assessment and data often come in. Building from baseline assumptions of preparing students for “college and career readiness” means baseline assumptions of

proficiency and lining students up, academically, to where and how they measure up.

AnSpec helpfully illuminates just how limited our approaches to data and design in schools have been. We identify individual students as a means of comparing their progress to one another or otherwise locating them spatially, cognitively, or socially in comparison to peers. The thing about proffering data through systems that sort and compare is that such practices become shorthand for labeling what characteristics make up the definition of a student. An attendance record, the scores on a reading assessment (like the one mentioned in this book's introduction), a list of disciplinary infractions over the years, and perhaps a grainy photograph uploaded to a school database . . . these do not a student make. They help us recognize that such an approximation of an individual through data points can never be enough. While we may simply see a sliver of a singular identity, the individual, identifiable humans (in AnSpec parlance) are not actually erased when students become metrics.

Considering that the spectra of measuring and designing learning are created by adults, we wonder what happens when we shift the axes of this spectrum and find ways to meaningfully allow authentic youth voices into these spaces. While this wisdom obviously helps ensure that students acquire experiences that may be meaningful to them, maximal productivity does not always equate to maximal joy or meaningfulness. With this perspective, the rest of this chapter looks at how play can be the center of speculative aspirations in schooling.

Speculative Schooling, Data, and Justice

In our description of formal schooling in the opening of this chapter, we intentionally did not talk about the guide-rails to which we are holding fast: justice, joy, wonder, possibility, transformation. To be clear, it's not that these do not exist in schools—much of our teaching careers in K-12 settings were intentionally focused on instilling these feelings within our classroom spaces. The current *purpose*

of schooling—as an interlocking institution with other aspects of governed life—does not hinge on these aspects. However, building from the inviting spirit of la paperson (2017), there are always decolonial possibilities resting within the colonial systems of schooling. How might we awaken them and spring the joints of action toward freedom?

We recognize that kids can (and should) be creative in schools; that—contrary to the perception of play as something that can “provide relief from the strain and tedium of formal schoolwork” (Dewey, 1903)—creativity is central to both the vocational and civic outcomes at the heart of schooling’s purpose as well as to the critical visions of moving these enterprises ever closer to freedom. Of course, there *are* some models of centering play in schools. A lot of them, frankly, are bad. Like our gripes with of educational games, forms of playful school approaches that focus on the data rather than on the people and their experiences are usually no fun at all. If a playful product can be stripped down to attaining points or value within a system or to masking un-fun tasks akin to chocolate-covered broccoli, it usurps the fundamentals of joy and play for meritocracy and productivity.

Although we have devoted an entire chapter later in this book to ways games might shape our interpretations of data and design, we want to emphasize here that play and creativity are tantamount to shifting the perspectives of what might be possible in schools today.

Look at any playful learning environment and notice the chaotic energy and noise. Yes, there are forms of logic and organizing structures at work even in spaces that intentionally focus on not upholding structure. However, it is *hard* to measure what play looks like in these spaces, let alone learning. When we move out the restrictions of schooling, learning does not get easier to measure, but it probably does get easier to achieve. Watch students long enough—the ways they maneuver, innovate, and collaborate in play spaces, particularly younger kids who have not been schooled out of these

playful practices—and you will see robust forms of sustained learning to which schools can only aspire.

Play can uproot the problematic role of data in schooling the bodies and minds of young people today. But such work requires reimagining our data-collecting practices and uses as well as expanding what kinds of data count. Perhaps, as one kind of lens, we might consider how to disrupt power hierarchies and lean toward freer approaches to social interaction. That messy playspace of youth innovation and collaboration—that space we have all inhabited in various contexts in our lives—ought to be central to our students' experiences with their education. How can we attune our relationship to informed meaning making and data metrics to the *affective* domain of these spaces? How they feel and what they inspire in their participants: these are the kinds of ways data might be actionable. Getting to these understandings, however, will require having open and reflective conversations and inquiry alongside young people and looking at these environments as spaces for opportunities to disentangle education from the assessment-driven metrics that currently foreground specific visions of schooling. Admittedly, that is easier said than done; however, if we are serious about working toward data-driven justice in classrooms and schools, it means realigning how data shape what transpires in schools and, indeed, realigning what counts as data.

As lofty as this vision may sound, we want to emphasize that there are precedents for our aspirations. They do not necessarily embody schooling structures at scale; instead, those innovative practices for playful learning that emerge on streets, in social movements, and alongside moments of social rupture echo the promise that we might build upon for understanding and designing with data today. Frankly, we build off artistic and political movements that situate play as a driving force for critiquing and resisting capitalist-driven social forces. For example, we draw inspiration in this chapter's vision of schooling from student-led protest movements throughout

Europe in the 1960s, such as the Situationist International (SI)—a group that might be best understood as a messy conglomeration of artists, theorists, and social activists loosely working toward upending and critiquing wide-scale capitalism. SI drew from Dadaism and surrealism to construct messaging/protest that was equal parts confrontational and playful in nature. Salient to this chapter, the methods employed by SI resonate as familiar countermovements against both technocentric policy and the violence of oppression. Protests, publications, and loose organizing all play important parts in the day-to-day operations of SI. However, key theories that emerged or came into prominence because of SI build up the role of play and ingenuity at work for strategic and social purposes. For example, the idea of “detournement” (Debord, 2020) was a key principle of SI that focused on taking existing media messaging and *turning* it toward new, critical purposes. Detournement is inherently about playing with media, messaging, and audience and working toward particular liberatory ends. Writing about detournement in a student publication in 1966, the members of SI explained the approach as “a form of action transcending the separation between art and politics: it is the art of revolution” (Dark Star, 2001, p. 25). While these approaches to media have continued in the more than half a century since the rise and fall of SI, the emphasis on how to play with media has been increasingly limited in schools (even if there is an acknowledged role that bad faith “disinformation media” play enjoys in fighting actual political democracy today). Rather than suggesting that media literacy should be expanded as an area of emphasis in schools, our perspectives on how detournement might inspire new interpretations of data and its uses in schools mandate critiquing within and across existing systems of data collection.

Playing with the existing tropes of schooling and its use of “big” (and increasingly *bigger*) data in all aspects of the lives of children, how might we disrupt and innovate regarding what is possible with data? What are the playful ways you might spin data toward

imagination? Toward exercises in freedom and speculation with young people? How might you open these questions to an entire ecosystem of people involved in schooling, including parents, custodial and clerical assistants, librarians, and local businesses? How might broad perspectives *about* schooling change the means and purposes of data collection, and how might such integrative exercises be transformative in and of themselves? In Antero's work helping with the design and grassroots efforts to open a school in Los Angeles, it was often the local canvassing, door-knocking, and community-centered dialogues that were most transformative for the long-term envisioning of this work and the participants involved in it. The act of *asking* and the imagination it instilled was often much more important than the forms of data intake mandated as part of the bureaucracy of school operations. A slogan that showed up in an early SI publication is a reminder of how the means and the ends of organizing must be vigilantly interlinked: "If you make a social revolution, do it for fun" (*Situationist International Online*, 1967, p. 24). Justice is certainly serious. However, it must be mingled with the imaginations that US schooling has tried its damndest to squelch in our young people. If we truly want to remake our schools (and our data within them), then play, care, and relationality must root our actions; they comprise the bulk of what makes us human and also tie us to the more-than-human communities within and around our schools.

Toward Just Schooling Futures: A Final Frontier

Earlier in this book, we promised science fiction and speculative education: how do media and/or society help educators and designers imagine new and more desirable contexts of engagement with learning? When it comes to schooling and depictions of it, the storytelling of an imagined tomorrow falls woefully (perhaps dangerously) short. It is shocking that the best-known examples of schooling in science

fiction are pale reflections of existing reality. We can imagine living in spaceships that travel through the fungus-based sublayer of reality (“Star Trek: Discovery,” 2022), but everyone on said ships still seems to have attended schools that required them to take daily catch-up quizzes and memorize the dates of the events of World War 2 and World War 3.

While there are occasionally counterexamples—Le Guin (2012, 2015) is heroic here—much of the world of popular science fiction exaggerates the dangerous uses of data and assessment that are representative of some of the worst schooling practices we’ve seen over the past century. As before, it’s useful to look at *Star Trek*—a reasonably consistent, realized vision of a progressive (or, at least, postcapitalist) future. Schools in *Star Trek* follow a few divergent paths, of which Starfleet Academy is the clearest. Starfleet Academy is, effectively, a model of a US elite university in the 1980s combined with professional practice. There are lectures in a large hall, people are tested on their memory of events through history. Certain professors are mentors, others are didacts. In short, the vision is not far from an old-but-lightly-idealized version of how current universities often suggest that they work. This is combined with limited versions of the diegetic technologies: rather than having a whole class with a simulated Professor Maya Angelou or Isaac Newton, say, they will go for short amounts of time to practice starship maneuvers in a “holodeck” (a fully immersive, tactile simulation environment, in which everything is “real” unless it would hurt the user of the holodeck).

Indeed, some version of the holodeck seems crucial to many visions of the future. Like the holodeck, the Danger Room in the *X-Men* series is a room that recreates and prepares individuals for the world around them. Strikingly, the vision of the world imagined by this room’s design is that the world beyond the walls of the school is a threat to individuals (particularly *mutant* individuals). As its name implies, this room is focused on preparing students for physical confrontations with others—the “danger” here is intentionally foregrounded in the

purpose and pedagogy of the room. As a deeply and problematically designed *simulation* of a world threatening personal safety and liberty, we might consider: What kinds of similar assumptions are embedded within the unnamed danger rooms of schools today? What are seen as explicit and implicit threats in the spaces of state-sanctioned instruction? Lessons of passive engagement with democratic participation (e.g., Garcia & Mirra, 2019; Mirra & Garcia, 2017) or understanding globally competitive engagement in systems of capitalism are key aspects of how most schools function; these are the robotic lasers and swinging robots of the contemporary “danger room,” and we might consider how alternate designs could shift these perceptions. Ironically, many of the ways in which simulations like the Danger Room or the holodeck used to seem futuristic are already possible but seldom used. The starship maneuvers, for instance, seem almost identical to virtual reality (VR) simulations of the same (many currently exist for the home console, both in VR and on screen). It is expensive to toss around a user as a simulation might do it, but it is not impossible. NASA, for example, trains astronauts in just such an environment. One argument as to why these are not more in use is that they do not mesh well with the current models of schooling described at the beginning of this chapter. They feel like “play” (for one)—they do not feel as if they should be graded. As we describe in chapter 6 (about assessment), the grading feels unfair even in the idealized future of *Star Trek*; playful learning cannot be a high-stakes test, almost by definition. Until there is an obvious way either to neuter the enjoyment of a simulation more effectively or find a way to “grade” it in a way that feels fair to pupils, the genre of playful simulation-based learning remains on the periphery.

As we described earlier, school, in its current incarnation, is odd for how it feels so all-encompassing while also being such a new phenomenon. That is a testament to the institution of schooling struggling to justify its existence. Illich (1971) investigated ways that the pedagogical model of didactic schools was inherently oppressive,

inspiring later movements such as constructionism (Holbert et al., 2020) and the learning sciences more generally. Illich's version of "deschooling" feels both remarkably prescient and remarkably dated. He proposed peer-to-peer schooling models in which people would connect in a kind of "[social] peer-matching network" and teach each other. Sadly, that seems like it may have been a bad idea, as contemporary social networks have been shown to harm young people (boyd, 2014). Even when the intention is education, massive open online courses (MOOCs) tend to help the well-resourced most (Reich, 2015), and Facebook creates disinformation bubbles among people who already know each other (Bakshy et al., 2015).

Most versions of future education look less like institutionalized schooling in the US and more like the "apprenticeship models" that both academic and nonacademic trades have used for thousands of years. A notable hybrid example comes from the genre of fantasy which, for reasons somewhat unclear, have settled on a hybrid of Oxford University and trade guilds (let's call this the "magical elite" model).

In many sci-fi scenarios, the data are treated more carefully in corporate-fascist dystopias than they are in the US now. It is notable that, despite the global, fully connected, unlimited computation environment in "Ready Player One," individuals are far harder for a fascist state to find and identify, than Matthew was when he left his keys on a picnic table at a national park (side note: special thanks to the unknown, well-meaning hiker who got them to him).

Illich (1971), in contrast, proposed that freely given personal data made intentionally public would be a revolution for education. It is perhaps ironic that, at the time of writing, we freely make public very personal data for corporations to use and disseminate, and that is a source of misinformation that has drowned out schools. For every biology student taught about the process, value, and epidemiology of vaccination, someone online has claimed that expertise in suggesting that vaccines might turn you into a frog and that it has

probably happened to their cousin's best friend. Both are appeals to evidence, but only one is an appeal to empiricism; they stand on the same legs without any aspect of trust in the expertise afforded by the role of teacher.

On broken schooling Across the examples in the second half of this chapter, we recognize substantial limitations in how science fiction has imagined future models of schooling, broadly. Granted, this is not a comprehensive review of the genre, but we do offer these depictions as generally representative of what popular culture sees as future forms of learning and schooling. What is missing from most of these models is how the students' behavioral data changes how they are taught. In the magical elite model, the teacher is the absolute expert. It is rare that a senior wizard or instructor says, "It looks like the magical-wizard-evaluation-tool says your wrist was pronated 23 percent too far. That's why Rincewind turned into a donkey," or even, "Thanks, young adept, I wasn't thinking of the problem that way." In the electronically mediated and imagined future of living on spaceships amidst alien life, the ways individuals respond to instruction is often blandly in the mode of Skinner (1965). The actual *pedagogy* and the rationale behind why data are deemed important today are not considered.

Despite Silicon Valley's efforts to prove otherwise, systems of effective learning are human-driven. Although current systems of datafication in schools have tried their darndest to move beyond this simple point, these systems continually fail to substantively shift or address the lasting inequities in US schools. Data as it is currently understood and enacted in schools does not "fix" much of anything right now, and that's because it is a bandage for a larger oversight in discounting teachers, the teaching profession, and the undersupported dreams and desires of young people. As students and as teachers, *people*, and our relationships to them, matter. If we know that corporations are good at finding value and extracting the freely given

data from schools, we should probably move toward more fully understanding why this data does little to aid what students do in schools and in their lives beyond schooling.

These are systems that have grown rigid around fixed assumptions about data. But we can change this fact. We can break these systems if we choose. In this way, we are suggesting that we envision breaking apart our intertwined relationship with limited forms of data within schools. From these broken pieces, might we repair schools around healing, playful, and transformative new visions of data?

In his Nobel Prize acceptance lecture (1992), poet Derek Walcott explained: “Break a vase, and the love that reassembles the fragments is stronger than that love which took its symmetry for granted when it was whole. The glue that fits the pieces is the sealing of its original shape.” In the same spirit as Walcott’s vision of love repairing cultural and historical traumas, how might we glue together new models of schooling that push beyond blasé understandings of tracking and assessment? How can we extend our thinking beyond the rote and banal visions of science-fiction schooling? Rather than simply seek answers in the digital, we must excavate meaning in the analog, human interactions with young people and with teachers.

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The Left Hand of Data

Designing Education Data for Justice

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