

*Robots in School: Disability and the Promise (or Specter?) of Radical Educational Equality*

Aaron Saiger

Professor of Law, Fordham University School of Law

**DRAFT — Please do not quote or cite without permission of the author**

## I. INTRODUCTION

A recent *New York Times* [story](#): A nine-year-old South Carolinian named Lexie Kinder, suffering from an immune disorder, is tutored for years at home to avoid infection. Then she is taught to control a [VGo](#), a “camera-and-Internet-enabled robot that swivels around the classroom and streams two-way video between her school and house.”<sup>1</sup> The VGo, dolled up by Lexie in a pink tutu, ends the little girl’s pervasive isolation. Her robot, which looks like a laptop and webcam bolted to a child-height cart, sits at an ordinary school desk, interacts with both teachers and classmates, stands in line for recess, and even is evacuated with its controller’s friends during fire drills.

For any parent of a disabled child — for any parent, really — the [slide show](#) that the *Times* posted to its website to accompany its story grips both mind and heart. Technology, in particular the robot-plus-internet model, seems suddenly to offer real hope of mitigating the many educational disadvantages faced by the disabled. It tantalizingly hints not only at the possibility of genuine equality of educational opportunity for disabled children, but of real social integration to boot. Were I the parent of a child like Lexie, I would be exuberant. I would also be on the phone to the VGo distributor. Were I the parent of a disabled child whose challenges were different from Lexie’s, I would likely be nearly as enthusiastic, joyously welcoming the possibility of adapting her family’s model to my own child’s needs.

The potential of robotic technology to realize these kinds of equality is very real. But this paper argues that, in the context of the legal structures that govern education of the disabled, robotic technology is also deeply threatening. The same robots that can open schoolhouse doors that had been closed to individual children with disabilities can, collectively, work to slam those doors shut for the disabled as a class. The idea of “special” education is that the disabled have special needs that must be protected by a grant of special legal rights. The very ability of robots to satisfy those needs in ways heretofore unimagined has the potential to erode the justifications and the institutions that guarantee special legal rights. This could move disabled children backwards, towards less equal educational opportunity.

## II. MUST A SCHOOL PROVIDE ROBOTS?

The technical law of special education is a bit exhausting. There is speculation in the literature that the overwhelming jargon and process requirements of special education are

---

<sup>1</sup> Robbie Brown, [A Swiveling Proxy That Will Even Wear a Tutu](#), *New York Times*, June 7, 2013.

features, not bugs: the system is consistently and substantially underfunded, and would collapse were every disabled child to claim the full benefits to which she was entitled. But to understand the educational impact of robots for disabled children, the technical workings of the Individuals with Disabilities Education Act (IDEA) are the place one must begin.

The first critical legal question that Lexie Kinder’s story raises is whether Kinder’s family is entitled to have her robot provided, free of charge, by the state. Legally, this question comes to whether the robot is a “related service” under the IDEA. A second question is what else has to happen for a school district to have to provide this particular related service.

I think that Lexie Kinder’s robot is indeed an IDEA “related service.” Under the IDEA, the federal government provides states with federal subsidies for the education of children with disabilities. States that choose to accept these funds — and all states do so — must promise in return to provide to all children with disabilities in the state “a free appropriate public education” in the “least restrictive environment” that is possible.<sup>2</sup> The IDEA defines “a free appropriate public education” as “special education and related services” that are provided “at public expense,” are educationally “appropriate,” and are consistent with an “individualized education program” that the state must prepare for the student.<sup>3</sup> It defines “related services” as “such developmental, corrective, and other supportive services (including ... orientation and mobility services) ... as may be required to assist a child with a disability to benefit from special education.”<sup>4</sup> And it defines “special education” to mean “specially designed instruction, at no cost to parents, to meet the unique needs of a child with a disability.”<sup>5</sup>

So: South Carolina accepts IDEA funds. It must therefore provide Lexie Kinder with a “free appropriate public education,” which means both “special education” and “related services.” Whether the robot is a “related service” is determined by whether it meets the statutory definition. In Lexie’s case, I think it does: in particular, the definition of “related services” includes “mobility services” that are necessary for a pupil to benefit from special education. This might be disputed. Lexie stays home; it is the robot that physically “goes” to school. But although the robot does not give Lexie physical mobility — she of course not mobility impaired — nevertheless the robot increases what might be called Lexie’s virtual physical mobility. But for the robot, Lexie could not “be” in school among her peers, or “move” around the building once she gets there. I conclude that her robot is a mobility service.

This point, somewhat ironically, depends not only upon the particular nature of Lexie’s disability but also upon the relative unsophistication of the VGo arrangement. Some other kinds of robots — those rigged to assist with fine motor operations, for example, or to help physically to transport a student — are undoubtedly related services. Lexie’s robot is more uncertain, because it is controlled remotely, though I still think it a “mobility service.” More complicated remote robotic technology, of the sort that might be useful to students with motor, language, or other impairments, might well fail to qualify as a required “related service.” In particular, robots whose operation involves the implantation of neuroelectronic interfaces in the

---

<sup>2</sup> [20 USC § 1412\(a\)\(1\), \(a\)\(5\)](#).

<sup>3</sup> [20 USC § 1401\(9\)](#).

<sup>4</sup> [20 USC § 1401\(26\)\(A\)](#).

<sup>5</sup> [20 USC § 1401\(29\)](#).

brain would be disallowed under a statutory exception that does not require school authorities to provide related services that involve any “medical device that is surgically implanted.”<sup>6</sup> It is easy to imagine disputes about whether non-implanted components of a robotic system would remain “related services” or whether dependence upon an implanted device would move the entire system out of the “related service” category and into the category of nonsupported medical interventions.

Once a robot is determined to be a “related service,” the next question is whether the state must provide it “at public expense.” This depends upon whether it is “required to assist a child with a disability to benefit from special education.”<sup>7</sup> That determination rests with the team that must develop, for each child, the “individualized education program” (IEP). This team, which consists of the child’s parents along with school personnel, determines specifically for that child what constitutes an “appropriate” education and what particular eligible services, responsive to that child’s particular needs, must be provided. Formally under the law, cost cannot be an obstacle to providing each child an “appropriate” education. The question for a student in the situation of Lexie Kinder, therefore, is whether her IEP team will determine that the robot is necessary in order for her to receive an appropriate education.

In practice, perhaps the most critical feature of the IEP process is that parents must be part of the IEP team. Parents exercise not-complete but very substantial veto power with respect to the IEP. If they object to its contents, the IDEA requires the school to leave any earlier IEP plan in place during lengthy and expensive due process proceedings. This results in substantial power for parents who are prepared and able credibly to threaten to use their blocking power. As the literature makes clear, parents with knowledge and resources can often use this power to secure services through an IEP that might not, strictly speaking, be necessary for an appropriate education.<sup>8</sup> Another way to describe this dynamic is that the IEP process gives parents substantial negotiating power in reaching a settlement of any potential IEP dispute. This power, of course, is differentially available to parents; one needs knowledge, sophistication, and resources in order to deploy it effectively. The literature is also clear that underresourced parents are more likely defer to school personnel in IEP development and routinely secure less favorable treatment for their children.<sup>9</sup> This works for schools in part because IEPs and due process proceedings that result from challenges to IEPs are not precedential.

The upshot of all this is that it is not absolutely necessary for robotic technology, or any other technology for that matter, to meet the definition of “related service” and to be necessary to an appropriate education in order to have it included in an IEP and provided by the state free of charge. Rather, the statutory definition of “related service,” the judicially developed appropriateness floor, and the procedural advantages that parents enjoy under the statute form the umbrella in the shadow of which settlement negotiations are conducted. It seems quite

---

<sup>6</sup> [20 USC § 1401\(26\)\(B\)](#) .

<sup>7</sup> [20 USC § 1401\(26\)\(A\)](#) .

<sup>8</sup> See Eloise Pasachoff, *Special Education, Poverty, and the Limits of Private Enforcement*, [86 Notre Dame L. Rev. 1413](#) (2011).

<sup>9</sup> See *id.*

likely, therefore, that if arrangements like the VGo offer some subset of disabled children substantial educational advantages, as certainly seems to be the case with Lexie, then they could appear in IEPs and be publicly provided to those children.

It is for this reason that I feel confident that school officials in many places read the *Times* account with a shudder: Notwithstanding rules that decree that costs cannot matter, school authorities are and must be driven by cost. Disabled children consume a disproportionate share of school budgets. Schools sometimes go to considerable lengths to avoid such costs.<sup>10</sup> And robots, like any other new technology that opens new horizons for the disabled, are expensive. School districts are repeat IEP players, and although the system gives them substantial incentives to settle, their settlement policies are surely cost driven (though they may never say so).

In a situation like this one, however, where it is easy to make the case that robots for children like Lexie are genuinely necessary “related services,” it seems likely that states will accept their inclusion on IEPs – if not on a parent’s first request, then ultimately to those parents who stand their ground. Given the budgetary consequences, however, we should anticipate both systematic downplaying of the potential of the technology by school officials, resistance to its adoption, and patterns of unequal access that make it available only to those best positioned to insist: the wealthy, the privileged, and the photogenic.

Distributional inequities aside, however, this result seems both normatively desirable, uncontroversially so. Lexie Kinder was isolated and lonely before her VGo; with it she is much closer to being in school, among her peers. This seems entirely compatible with what we want, and what the IDEA wants, for disabled children.

### III. MAY A SCHOOL PROVIDE ROBOTS?

Costs will go down, and meanwhile, in the shadow of litigation, schools may learn to bear them. A world may soon emerge in which robots are a quotidian entry on the menu of services available to the disabled, not worthy of attention for the *New York Times*. This world raises a set of issues whose legal and policy implications are much more challenging than those involving whether to have public provision of robots to disabled children in the first place. The first critical question in this new world may well be not whether school districts must offer disabled students robots, but whether they *may* offer them robots in preference to other varieties of accommodation.

The prototypical cases I have in mind are students with motor, verbal, visual, auditory, or health disabilities who, unlike Lexie Kinder, can physically come to school and participate in a school program, so long as various accommodations are provided. A motor handicapped child might require and be given things like wheelchair-accessible front doors, classrooms, and bathrooms, differently designed classroom furniture (desks, tables, waterfountains), and so on. Similar accommodations might also be designed for a visually handicapped student. The visually impaired, as well as students with hearing or other sensory problems, might also be provided with various kinds of on-site adaptive technology. Students with health issues or risks might be assigned “shadows” who accompany as they make their rounds throughout the school

---

<sup>10</sup> E.g., Carin Rubenstein, [A Festering Border War Over School Access](#), *New York Times*, August 22, 2004.

day, on order to protect them from allergens, guard them from adverse health reactions, or monitor their physical well-being. “Shadows” are also sometimes retained for children with social and behavioral disabilities, to protect them from others and, sometimes, to protect others from them.

In each of these cases, remote robotic technology has clear appeal for schools. On grounds of cost a school might prefer providing a robot to retrofitting a classroom worth of school furniture (and potentially re-incurring the need to do so every year). But the benefits extend beyond the fiscal. Given the frustrations that children with motor handicaps can sometimes experience even in adapted environments,<sup>11</sup> it is also possible that a child with this sort of disability might find it easier to navigate a robot throughout a school and classroom than his own body.

Students with other common disabilities might feel similarly. Visual and auditory adaptive technology could be provided as part of the interface with the robot, rather than throughout the school. This likely again could be cheaper than in-school technology, but it might simultaneously provide educational advantages. It might be, for example, that the adaptive technology could be more sophisticated and user-friendly if it were provided at the end-user interface with the robot’s controls. Doing so would also make the adaptations available regardless where the robot was in the school, including when it was on the move, as well as at fixed stationary locations. This could give a student much more access to the educational program, both formal and informal.

With respect to students who need “shadows,” robots also offer what in some ways is an attractive alternative. For the allergic child or the bullied child, remote attendance negates risk of harm to self; for the aggressive child, it negates risk of harm to others; and either way, the robot could be cheaper than the shadow. For a child with attention deficits or seizures or Tourette’s, a robot is a way to avoid classroom disruption, which is painful not only for schools and teachers and peers, but for disabled children as well.

These are genuine benefits, but there is of course a genuine offsetting cost (in the nonfiscal sense), which is that the disabled student is no longer *in* school. The *Times* article discusses how Lexie Kinder’s classmates adopted her VGo, taking it with them to recess and refusing to abandon it in fire drills. This is lovely, but it is not the same as Lexie is actually living and playing among those children. For Lexie, whose disability prevents her from being physically proximate to other children, the robot is a clear improvement. But the lack of physical colocation would not necessarily be an improvement for every disabled child.

One can imagine different families coming to different conclusions about this kind of question, depending upon the nature of the disability involved but also upon the nature of the school, the strength of families’ preferences regarding social integration, academic learning, and other factors. In the case of students with social disabilities, there is also the potential for harm to others. One can also imagine parents and school officials having different preferences from one another with respect to these issues in a particular case. And schools, though not allowed to consider cost, might use such preferences as a proxy for costs in some instances.

---

<sup>11</sup> E.g., Lisa Belkin, [The Lessons of Classroom 506](#), New York Times, Sept. 12, 2004.

Somewhat surprisingly, given the overall policy posture of the IDEA, special education law puts a heavy thumb on the scale with respect to this question. In general, the approach of the IDEA is to defer to parents and to schools with respect to identifying the programmatic elements necessary to make education “appropriate” for each child. IDEA departs from this paradigm in one respect, however. It insists that educational equity for the disabled requires not only that the disabled be accommodated but that they be accommodated *in the mainstream*. The technical requirement of IDEA is that disabled children be placed in the “least restrictive environment” consistent with their needs.<sup>12</sup> This “LRE” requirement is motivated by two policies: the desire to avoid segregating disabled and typical children, so that the disabled are not marginalized and rendered invisible; and the recognition that for many disabled children social and interpersonal skills a critical focus for their educational needs. Without mainstreaming, in the view of the framers of the IDEA, disabled children cannot be educationally equal.

It is easy to imagine how robotic technology could become a marker of exclusion for children with disabilities who could otherwise, with various kinds of accommodation, to be educated in the mainstream. Robots, compared to kludgier and less elegant accommodations, might not only be cheaper but formally more effective; nevertheless, expensive, partial, and ineffective accommodations puts students into classrooms with their peers. The same kind of robot that opened a social world to Lexie could socially isolate other children, blocking them from the fullest possible participation in the worlds of play and social interaction, even as they facilitate the more formal aspects of their schooling, made them physically and emotionally more comfortable, and protected them and others from harm. In particular, it seems plausible that robotic technologies could routinely place worlds of formal and informal education in tension. Students with certain kinds of disabilities might get more and better formal, “book” learning via robot than in person; but their social world, their “informal” education, would potentially be narrowed.

The IDEA, and the culture of special education that has grown up around the statute, insist that this trade-off is not worth it: the disabled, insofar as is possible, should be in the mainstream. But of course the LRE requirement is not black and white as a matter of law, just as it is not obvious that mainstreaming is best for every child. Legally, LRE is a presumption; mainstreaming must be provided for insofar as it is possible. Again, however, the way in which the IEP is a settlement or contract between parents and schools, negotiated in the shadow of the statute, can mean that the contents of an IEP do not always reflect strict statutory requirements. Schools are supposed to reject IEPs that do not conform to the mainstreaming requirement and provide LRE; but if that is the parents’ desire, they may be reluctant to object. Parents can insist on mainstreaming and, if they are prepared to fight, ought to win; but some parents won’t fight, and others will actually prefer to avoid mainstreaming. And if schools can cajole or convince parents that robots have their merits, they may be able to get parents to agree to them even when they conflict with LRE; in such a case, legal consequences are unlikely.

I feel no doubt that, if this kind of technology proliferates, some parents will pressure schools to provide robotic accommodation even if in-person accommodations might be had. They will do this for both good and bad reasons. More difficult, in such a world, is that some

---

<sup>12</sup> 20 U.S.C. [§ 1412 \(a\)\(5\)\(A\)](#).



schools will likely pressure parents to *accept* robotic accommodation even where there are in-person alternatives. Again, the objecting parent with power and resources will be able to block such a move, but not all parents have power and resources. And some parents might come to agree with the suggestion, if their own prioritizations do not match those of society as reflected in the IDEA.

At a deeper level, the proliferation of robots could begin to affect what it means to *be* in the mainstream. I state above that a robot could be a “marker of exclusion”; but it will become less and less of a marker if robots proliferate. I state above that a robot could catalyze actual social isolation, but this too may be mitigated as typical children spend more and more time in virtual realities and virtual social spaces. These changes will be long-term, discontinuous, and potentially not all in the same direction. But it does seem clear that robots, and information technology more generally, will begin to change what the mainstream is, and therefore how we think about the mainstreaming presumption.

#### IV. WHAT IF ALL CHILDREN WERE GIVEN ROBOTS?

Thinking about a changing notion of the mainstream shows how the robot is different in kind from accommodations like wheelchairs, ramps, or in-class aides. The robot could change what a classroom looks like; what we think of as a school; what a mainstream is. It forces us to be explicit about issues like the relationship between formal education in the classroom and the informal life of hallways, cafeterias, and ballfields. When formal and informal are bundled together, we have no problems saying that disabled students must be accommodated not only formally in class but informally in the hallways too. But when they are in tension, as robots might place them in tension, we need to ask: which do we privilege? Statutes like No Child Left Behind,<sup>13</sup> which measures success by whether disabled children enrolled in particular school or system can pass standardized tests at the same rates as typical children, clearly privilege formal education. But for many parents, informal education is paramount.<sup>14</sup>

Thinking about what a partially roboticized *mainstream* would be like leads in particular to a startling query: What if *all* children, disabled and typical alike, were offered robots? That future, although surely not immediately at hand, is now imaginable. Robots allow disabled children to overcome the challenges posed by distance, transportation, idiosyncrasy, and bad fit in their current school. These problems are faced by most, if not all, children. All-robot schooling could offer the exciting possibility that children could enroll in schools whose programs best met their needs, regardless of location. Consociational commonalities could replace geographic proximity, the factor that now dominates such decisions.

Of course, if all students had robots, it does not take much to realize that it would be more sensible to give *no* students actual robots at all. The physical machines, along with the physical buildings and the physical infrastructure, could be replaced with virtual, Second-Life style school environments. In such virtual schools, with their radically different cost structures, one can imagine a radical educational equality: not only disability but race, class, gender, and other markers of difference could be obscured at will.

---

<sup>13</sup>[20 U.S.C. §§ 6301ff.](#)

<sup>14</sup> E.g., Lisa Belkin, [The Lessons of Classroom 506](#), New York Times, Sept. 12, 2004.

The virtual school is much more technologically, sociologically, and pedagogically discontinuous than the robot-populated school. As I argue in other venues, virtuality opens the doors to new worlds of pedagogical innovation, differentiation, access, and assessment. But the dizzying scope of possibility also signals that seismic upheavals await existing institutions of primary and secondary education as they work to adjust to the information revolution. “Because of the absence of physical boundaries and access to resources that were not there before, students can learn anything, anytime, anywhere,” writes an enthusiastic observer.<sup>15</sup>

The implications of these changes for schools and school law are dramatic. Asynchronicity and aterritoriality pose existential challenges not only to standard practices of teaching, grouping, discipline, professionalism, and assessment, but also to the school district, for over one hundred years the primary governing institution for American schooling, and one deeply rooted in political geography and political culture. Unbundling and decentralization will catalyze an increasingly diverse population of educational providers, in part by encouraging already extant trends towards school choice and market participation in education, ideas which nicely match the internet ethos. They will radically shift our understanding of the law of student free speech, free exercise of religion, and school choice. And they have numerous far-reaching implications for student privacy.<sup>16</sup>

For the purpose of this paper, the deeply difficult question is whether the all-robot school, or its virtual analog, would be a more or less educationally equal place than an in-person school. Much depends upon one’s view of difference. Is a school equal if, as Chief Justice Roberts would have it, it ignores categories like race? Or is it equal only to the extent that it confronts, incorporates, and celebrates difference? This has been a huge question with respect to race, and has been equally important, and controversial, with respect to other kinds of intrinsic difference like gender and disability.

But it in many cases this kind of question has been essentially theoretical. Chief Justice Roberts was excoriated in many circles for saying that “[t]he way to stop discrimination on the basis of race is to stop discriminating on the basis of race.”<sup>17</sup> His interlocutors dismissed this view on the grounds that racial prejudice cannot be simply willed away: school systems, teachers, parents, administrators, and other students *do* pay attention to race, both wittingly and unwittingly. But the potential virtualization of education makes this kind of response to Roberts less convincing. By modifying or even eliminating the aggregation of students in space, virtuality could allow students to function without necessarily revealing their race, gender, and other characteristics to teachers or to each other. In such a world, it might become impossible to take notice of someone’s race, or disability, without their consent. Such technology converts Roberts’ suggestion that we pay no attention to race from idealistic aphorism to implementable program.

---

<sup>15</sup> Joan Thomrann & Isa Kaftal Zimmerman, *The Complete Step-by-Step Guide to Designing and Teaching Online Courses 2* (Teachers College Press 2012).

<sup>16</sup> All these issues, and many others, will be discussed in Aaron Saiger, *School in the Cloud* (forthcoming Oxford University Press 2015).

<sup>17</sup> [Parents Involved in Community Schools v. Seattle School District No. 1](#), 551 U.S. 701 (2007)



Is it a program that we should, or do, want? Its potential calls into question the most basic ways we think about the educational role of diversity, with enormous implications for legal regimes governing not only disability in schools, but racial and gender equality as well. Can virtual education respond to the needs of the disabled for education that is based in a social context? And, as for race and class, how can a world dominated by educational technology realize the social and educational benefits of exposing students to one another's differences?

## V. MAINSTREAMING REDUX

More broadly, one must consider that, noted above, real or virtual robotic education serves all children, not just disabled ones. Customization is the great appeal of such an effort—customization for all children, not just disabled children. It moves us towards a world where the education of all children, not just disabled children, is special education. “Special” education — read customized education — thus becomes not a particular right of the disabled but an entitlement for everyone.

Such an arrangement is the exact converse of the generated by current legal regimes. IDEA entitles the disabled alone customized education, which must be planned to meet their specific needs and whose appropriateness must be guaranteed. These rights, moreover, come with a right of legal action should the state fail to honor them. Students without disabilities, by contrast, have no rights to individualization or adequacy at all. Lawsuits alleging failures of educational authorities in these areas have been routinely dismissed for decades for want of a cognizable cause of action.

If all children, disabled or otherwise, are similarly situated with respect to customization, if every child's education is special education, this regime becomes untenable. In one respect this would be a great success for the cause of equality of educational opportunity. A system where the customization that disabled children need is the right of every child is one that is truly equal: the disabled need no special rights.

But there is also reason for concern. If every child's education is special education, it will become increasingly difficult to ensure that disabled children and their families are not left to deal with customization largely on their own: like other children, they will have to find their own resources and choose among, or develop, their own programs. And this is a species of precisely the problem IDEA was passed to avoid. When disabled children were simply consumers within the general education system, they were routinely marginalized. Cafeteria-style educational options, by several accounts, seem to work poorly for many disabled children. For example, a drumbeat of criticism regarding charter schools' response to disability indicates that they tend to find ways to avoid serving disabled children notwithstanding regulatory requirements that they do so without discrimination.<sup>18</sup> Virtual education, of course, is a cafeteria at an entirely different order of magnitude.

It is possible, of course, to imagine a regime that would preserve the special rights of the disabled even in a fully customizable world, one that preserved IDEA requirements like those that demand that public authorities locate children with disabilities, assess their problems, and

---

<sup>18</sup> E.g., Nancy J. Zollers & Arun K. Ramanathan, For-Profit Charter Schools and Students with Disabilities: The Sordid Side of the Business of Schooling, 80 *Phi Delta Kappan* (no. 4), 297 (1998).

identify and pay for the resources that they need. To do so is possible, though not easy. It will be even harder to maintain the mainstreaming presumption of the IDEA. The concept of mainstreaming the special education student assumes the existence of a general educational regime to which special services can be attached. If every child is special, this cannot happen. Children now in “general” education will not routinely provide a “mainstream” for disabled children if they are all customizing their own educational programs. The ways in which virtual education undermines educational community as we have understood it pose a special threat to disabled children. The law’s mainstreaming presumption is ill-designed to respond.

This is truly the tough policy question created by robots in schools. There is no question that the technology of remote education — Lexie Kinder’s VGo, robots that can be imagined for students with other needs and in other contexts, and even the virtualization of all those robots into a virtual school — opens doors to disabled children that many never imagined could be opened. Disabled kids and parents are surely and properly celebrating the emergence of this technology. It surely has the potential to make them not only better educated but also much more equal. But in doing these things, the technology could well make special education less special; and if it is less special, we must ask, will the legal system be able to guarantee the equality in the mainstream for the disabled that has been so hard, and is still only partially, won?