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The Berkman Center for Internet & Society
at Harvard University

Research Publication No. 2015-12

July 30, 2015

Student Privacy: The Next Frontier
Emerging & Future Privacy Issues in K-12 Learning Environments

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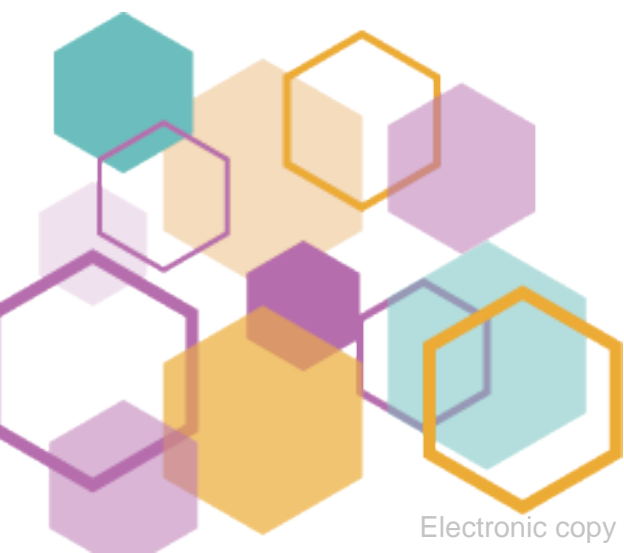
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STUDENT PRIVACY INITIATIVE

Berkman Center for Internet & Society

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May 20, 2015



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INTRODUCTION

Building off several prior working meetings which mapped and considered the implications of the new and rapidly evolving ecosystem of networked technology being used with education (“ed tech”),¹ the Berkman Center for Internet & Society’s Student Privacy Initiative convened a conversation in May 2015 among multiple stakeholders, including, but not limited to, K-12 educators, district administrators, academics, policy makers, and industry representatives. This working meeting was envisioned as one in a series of conversations which deepens our understanding of emerging and future privacy issues in K-12 learning environments, both formal and informal. Future conversations may focus on specific topics within the broader spectrum of issues relating to student privacy; this particular working meeting prioritized practicality over theoretical discussion, emphasizing the evolving experiences of K-12 administrators, educators, and students.

In order to evaluate the challenges and opportunities fostered by the next generation of ed tech, participants were asked to consider the following four layers of the ed tech ecosystem, each of which informs the others in myriad ways:

- **Technological Infrastructure:** What kind of technology can be considered “ed tech”? This layer encompasses cloud infrastructure, the Internet of Things, sensor networks, and other new technologies that facilitate connected learning environments² (which transcend the traditional classroom set-up, disturb hierarchies, and foster peer-to-peer interactions) and other educational innovations within brick and mortar classrooms, thereby shaping the collection and use of student/educational data.
- **Data:** What kinds of data are being collected, and how/by whom are they being used? This layer includes the opportunities afforded by learning analytics (the aggregation of data about learners, offering the potential benefit of individualized learning trajectories and the potential challenge of limiting or discriminatory “tracking”), as well as other uses by educators, administrators, and other stakeholders of individual and cohort-wide student data previously unimaginable in both its breadth and depth.
- **Organizational Structures:** Where does learning take place today? This layer maps the institutional forms of current and future educational institutions, from traditional schoolhouses to informal learning environments, which can be situated within the context of schools, cities, libraries, and elsewhere--and are perhaps best understood as part of the connected learning ecosystem.
- **Norms and values:** How do we want ed tech to be used in the classroom, and what are our expectations for/desires of privacy? This layer reflects those principles, policies, pedagogies, and practices that do or should animate the goals, implementation, and stakeholder experiences of twenty-first century digital education in its various iterations.

Keeping these layers in mind, discussion ranged widely across numerous themes, reflecting the participants’ diverse backgrounds and perspectives. This report seeks to summarize the conversation’s main themes and highlight suggestions for future action. In the following section, the main themes and observations are considered, including issues dealt with explicitly and at length, in addition to those that more quietly (and perhaps implicitly) surfaced at multiple points during the day. And although the third section concerns suggested areas for moving forward, these are meant to be understood as key highlights, and not a comprehensive summary.

¹ Notes from previous working meetings, as well as additional publications, can be found here: https://cyber.law.harvard.edu/publications/2014/spi_publications.

² See generally Mizuko Ito et. al, *Connected Learning: An Agenda for Research and Design*, CONNECTED LEARNING RESEARCH NETWORK (Jan. 14, 2013), <http://clrn.dmlhub.net/publications/connected-learning-an-agenda-for-research-and-design>.

CHALLENGES

A lack of established best practices, coupled with the explosion of ed tech, creates difficulties for introducing new ed tech into the learning ecosystem.

The rapid expansion of technology used for learning purposes has considerably complicated student privacy concerns, even as it has opened up many new educational opportunities. Educators and schools are not using one provider for their technology; rather, they are using multiple providers, platforms, accounts, and devices in a single school, and often even within the same classroom. Additionally, some participants argued that there exists a distinct lack of established best practices and norms for the design and creation of “user defaults” to protect privacy (known as “privacy-by-design”, as well as concerns around the long-term sustainability of ed tech systems currently storing student data. Because of the complicated mix of tools and procedures (which can vary from tool to tool), it can be a challenge to understand exactly who is in possession of what data, and how data responsibility is shared among the different players. Moreover, each piece of technology can be governed by individual and distinct policies or rules. Consequently, each decision to introduce a new technology into this already complex ecosystem increases in difficulty, layering onto existing, non-standardized classroom infrastructure and governing policies. Participants suggested that the ability of an educator or administrator to tailor a new application or device to collect only particularly desired types of data might mitigate this challenge.

To support innovative opportunities, it is important to move beyond the language of fear and communicate with parents and teachers in a constructive dialogue.

After initial successes at quelling fears that parents have had regarding the introduction of ed tech in the classroom, new privacy concerns and challenges have emerged in light of the ubiquitousness of the technology and the blurring lines between when and where learning is occurring (“connected learning” environments). Participants discussed how concerns for the privacy of students coupled with overly fearful dialogue could threaten informed and productive use of technology in schools. As a growing number of K-12 schools have adopted cloud-based technologies, which offer a broad range of applications and tools for use in the classroom and by educational administrators, new issues have emerged, such as the role of parental consent when schools transfer student data to cloud-based ed tech vendors, or questions around best practices for considering which actors in school systems are well-positioned to make decisions about whether, when, and how to use these new third-party technologies. Our developing understanding of privacy concerns associated with new technology will influence how ed tech is designed. To positively influence this conversation, it will be essential to aid parents in overcoming a sense of helplessness. This could be accomplished through a variety of measures, such as increasing parent outreach and communication or empowering parents with tools that improve district transparency and provide views into their children’s student data record stored within the school/district/state.

Additionally, empowerment should extend beyond understanding each individual technology used in classrooms. Participants suggested that there must be a clear distinction made between digital and information literacy; while digital literacy pertains to knowledge centered on the use of education technology, information literacy pertains to an understanding of the policies and systems that govern this technology. Moreover, and with this distinction in mind, empowerment should include the ability on the part of parents to advocate for a more sustainable privacy



infrastructure, including individuals, policies, and systems chosen and approved of by parents. In turn, this would serve to create more trust between parents and schools, as well as remove from parents the burden of having to make an informed decision each time a new technology is implemented in their child's classroom.

Also essential will be to normalize the risks of education technology, even as we work towards mitigating those risks. Participants discussed that it is important to understand that there is some risk, without necessarily inherent harm, involved in all situations where privacy is a concern, and that understanding what constitutes an acceptable level of risk will likely need to become a norm. One suggestion was to consider privacy risks as analogous to investment risks: risk is necessary for growth. Moreover, risk has always existed in the context of school, in various forms: chemistry classes, school bus rides, and many more deeply entrenched institutions. However, the potential risks of chemistry class have been identified and minimized. School email accounts for students are now near ubiquitous, and accompanying these accounts is the risk of data breaches and phishing. This risk has been mitigated largely by teaching students not to reveal any highly personal information in email, and to be wary of such attacks.

Surveillance for educational purposes has increased with the rise of ed tech, and though there are significant opportunities associated with surveillance, it is important to weigh the challenges and risks.

New and increasing uses of ed tech have given educators and administrators new abilities to closely monitor the behavioral patterns of students (as well as educators, on occasion). While this could in many ways be beneficial to education, it must also be critically examined and governed. Relying too heavily on education technology such as data management tools and dashboards, for instance, might create a risk in allowing data to be overly deterministic of the educational standing or track of a given student. On the other hand, video surveillance in classrooms can be used to track attendance and record lectures that students can play back at home. However, surveillance can also extend beyond the immediate classroom environment to playgrounds, bathrooms, and school buses. While it could be argued that such surveillance is an infringement upon student privacy, it can similarly be argued that such surveillance might be beneficial to education for purposes of monitoring attendance or physical/ emotional health.



OPPORTUNITIES

Instead of considering ed tech in terms of “privacy,” perhaps a shift in perspective and considerations of “trust” and “acceptable risk” are necessary.

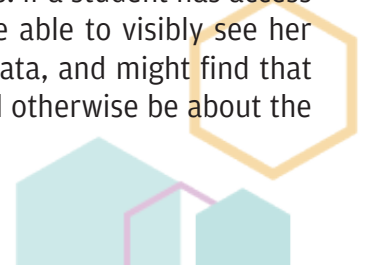
A key question for the privacy and ed tech conversation is the true feasibility of parents taking control of their children’s privacy via an opt-out system. One possible alternative is to promote trust in intermediaries and in conjunction with an understanding of the necessity of certain risks. Participants noted that opting out of using a particular technology is not always possible and may inhibit learning, as certain kinds of data are required to run services needed for school functionality. It might be beneficial to advocate trust in intermediaries (e.g., schools and other potential third parties such as “clearing houses”), which could act as centralized entities to vet new technology as it is integrated into the classroom. In turn, these trusting relationships would mitigate the necessity of individual parents having to personally investigate and make decisions about new tools. Additionally, relying on trusted intermediaries and establishing good faith partnerships between all stakeholder sectors – which will necessarily require increased dialogue between educational institutions, vendors and teachers – would streamline the process of vetting new ed tech and would help to remove the impetus from parents of studying in depth each new technology introduced in their child’s classroom.

Data collected by a district can be used for extraordinary positive effects in a learner’s education.

Students, parents, administrators, and educators can all benefit from the data collected by ed tech. Before discussing the use of this data, however, it is important to discuss its custodianship, because questions around storage and data security can perhaps be as important as the question of its use. Participants discussed the idea of having multiple data custodians for various parts of a single data set, and brought up the concept of having custodianship systems that have room to evolve over time as the uses and needs for the data change.

Administrators are typically very focused on assessment and the types of data which can drive funding or rankings. This data can come in the form of success rates, biographic data, and socioeconomic data, among others. Participants discussed the opportunities and challenges of requiring access to sensitive student data to be “tiered.” Many administrators, for instance, use dashboards to visualize data and identify trends on student and school performance. Educators can also use various types of data to quickly assess how well individual students are doing, or to tailor projects to students’ needs and interests, but it is likely that educators only need to view a subset of the information a district may have gathered on a student; a tiered access system ensures that educators are only able to see individual student data for their students, as well as information only being available anonymized and in aggregate to administrators at other schools or at the district level. Conversely, data might play a role in the development of future rating systems aimed at evaluating the performance of the teachers, educators, staff and administrators of the educational environment.

Students also benefit from administrator and educator use of data, and, indeed, there is potential for data to empower students to push back in situations where they might feel that they are being assessed unfairly (e.g., if a student is assigned a low participation grade, but the data shows that the student’s contributions are equal to others in the class). Data could also be used on an individual basis to encourage success: if a student has access to the data collected about her over the course of her academic career, she might be able to visibly see her improvement and derive inspiration from it. Parents can be similarly empowered by data, and might find that access to their child’s academic data allows them to be more informed than they would otherwise be about the academic progress of their child.



APPROACHES TO MOVING FORWARD

Research-Oriented Approaches

Case studies

Because there exists a wide range of ed tech, school policies, and education philosophies, case studies will be essential to deepen our understanding about the relationship between edtech and student privacy. However, there are many factors that might complicate the research methodology for these case studies, including, significantly, the opt-out option for parents. In order to properly consider the benefits of data collection in schools, case studies—particularly those which can consider long-term effects—will be indispensable. Case studies will also be important in determining whether there are equal opportunities for students, parents, educators and administrators to benefit from data collection and usage, independent of location and socioeconomic status. Participants raised the question of how these case studies would be affected by school districts constantly culling the data and allowing for opt-outs, acknowledging that there may be several challenges to conducting case studies on data use in school districts.

Viable alternative use cases

Education is a microcosm of a larger conversation around the future of privacy in the digitally connected environment, and so it may be important to consider whether there are other sectors which might be key reference points for creating good policies and legislation to protect the privacy of students while preserving room for innovation in learning. For example, the issue of surveillance is a national issue which affects many institutions in the United States, including hospitals, universities, corporate offices, etc. Surveillance in schools is thus a microcosm of the national discussion about surveillance, and it is possible that some of these aforementioned institutions have successfully addressed the issue of surveillance, and may as a result be an effective model for schools' treatment of surveillance. Additionally, the Fair Information Practice Principles, as well as the way in which these principles have been applied in the contexts of various other sectors, may serve as a productive reference point.³

Practical/Applied Approaches

Economic concerns

Governing data collection and protecting student privacy in schools is associated with certain costs (for example, districts may require multiple technology integration specialists and at least one privacy official at the administrative level). Furthermore, because of the cost associated with privacy officials, it may be challenging to ensure that low-funded districts do not suffer because of an inability to afford necessary privacy infrastructure. This raises an essential question: how will we deal with the economic impact of taking privacy seriously? Moreover, this extends beyond the governance of data to the use of data. Data analytics effective in improving the experience of students and educators are currently expensive, and there is potential for wealth discrimination that would ultimately widen the gap between high-funded and low-funded school districts.

Determining what constitutes “educational purpose”

Infrastructure-centric edtech is able to collect data about things such as behavioral patterns and emotional health. This new capacity gives rise to the question of what constitutes “fair educational use,” of student data generated outside of the classroom. States and districts are currently independently determining what constitutes

³ FTC (2000). “Fair Information Practices in the Electronic Marketplace.” <https://www.ftc.gov/reports/privacy-online-fair-information-practices-electronic-marketplace-federal-trade-commission>.

educational purpose, often on a case-by-case basis. While some districts consider athletic information, or data that predicts social/emotional health information as having viable educational use, others adhere strictly to the notion that only data generated in the classroom has viable educational use. Participants acknowledged the concern that almost anything could be justified as “fair educational use.” For an extreme and concerning example, monitoring bathroom visits could theoretically generate helpful information about attendance and physical and emotional health. Given the diversity of opinion concerning fair educational use across states and districts, participants also discussed the need for a more universal, common understanding of what is inappropriate or “creepy” to monitor and, more generally speaking, where the bounds of data privacy and protection lie in the educational context.

ACKNOWLEDGMENTS

Special thanks to Erin Maher and Annie Pruitt for their documentation of the working meeting; Elsa Brown for the document layout; and the Berkman core team for their support of Student Privacy Initiative events.

APPENDIX: STUDENT ESSAYS

The following includes a selection of essays by high school and college students on topics relating to student privacy. The views expressed are those of the individual authors and do not reflect the official opinions of the Student Privacy Initiative or the Berkman Center.

Friend Me Later

Facebook and its Social Power

Elsa Brown is an incoming freshman at Massachusetts College of Art and Design.

One Friday afternoon, at an average yearbook committee meeting, we stalked our peers' Facebook pages. The thing about yearbook is that you need pictures, and our image library was getting fairly scarce. Desperate, we turned to social media to find more pictures of students in their natural habitat.

"Are you sure this is ok?" a friend of mine asked.

"Eh, sure. We'll ask them later." I responded.

As the period bore on our nonchalance slipped into complete indifference. Instead of searching for useable photos we were digging up funny pictures of old friends and looking up the names of people we used to know. Some gems were funny enough to show the residing teacher, an approachable 28-year-old whom many felt close enough to call a friend. He'd look at a funny face or a screenshot of a memorable online conversation and say with a chuckle, "I don't need to know everything about your lives."

Which isn't to say he didn't take part in the fun, too. He showed us an amusing family photo of himself and his siblings and some pictures of him as a child making superhero poses. When asked if we could friend him on Facebook after graduation, he said, "People have asked me that, but no. You can try, but I'll never accept it. I have pictures on here from way before I ever knew I was going to be a teacher."

That got me thinking about what I'm comfortable with sharing online to an audience that I know personally. I only recently became comfortable with adding certain members of my family on Facebook. How would I react to someone of authority looking through my photos and reading years-old conversations with my friends in the comments? I've had the opportunity to add old teachers I was close with on Facebook before, but I never did. Why?

I asked some of my friends if they would let a teacher friend them on Facebook. The response was a wide "maybe, depending on the teacher," and one said that it wouldn't so much affect what he posted, considering he was already close enough to the teacher to add them. I kept in mind that a few of these friends had expressed anxiety over their online privacy before, going so far as to change their names on Facebook so colleges and other figures of authority wouldn't find them.

As of July 2015, Facebook is the most popular social network by traffic, with an estimated 900 million visits per month.⁴ Facebook allows users to follow the activity of their Facebook "friends" – status updates, pictures, and other kinds of information, like their relationship status, place of employment, and education.

Users "friend" other users by searching their name and sending them a friend request. It allows users to connect with friends and acquaintances, form groups based on specific interests, and get updates from larger entities such as musicians, news sites, and more. Users have the ability to follow what they want and control who follows them.

4 Top 15 Most Popular Social Networking Sites. (2015, July 1). Accessed July 2, 2015. <http://www.ebizmba.com/articles/social-networking-websites>.

Out of the users I know, some laud Facebook for its ability to keep connections, while others have abandoned it completely to avoid unnecessary distractions. Most users, however, have Facebook accounts simply because of the convenience (classmates share homework, friends invite other friends to events) and that there isn't an equal alternative - it's better to have an account that connects to everyone else than to start all over on a site that no one visits.

When it comes to security, users for the most part have control over who sees their information (at least in their friend list) - it's all decided by their privacy settings that they control. This serves to protect users from predators, which are a real danger on the site. Most friends of mine only allow their accounts to be accessed by mutual friends - this is what allowed us in yearbook to find photos. The most that is visible to everyone else in that case is their profile picture and cover photo, but this can vary from person to person. However, any lapse in judgment can be damaging - if a user posts problematic statuses or pictures of themselves and doesn't have strict privacy settings, it could ward off potential employers or other important figures. Even if the account doesn't affect anything official in a user's life, it could lead to simple embarrassment, which can hurt just as much.

The value of Facebook, from my perspective, is the sacred ability to keep in touch. As situations change, we lose track of old relationships, but Facebook allows us to stay connected even in a minimal way. Even if you're not chatting or tagging them in photos you've taken, you can see how they're doing in small ways. They might post a picture of a new dog, or announce what school they've gotten into. That being said, there's always more information to be found. My account is used mainly to interact with close personal friends, but an acquaintance is just as likely to stumble upon our inside jokes devoid of context and think less of me. And while it's not necessarily likely, anyone I friend on Facebook can go through my history on the site, digging up old and possibly embarrassing pictures or posts I've forgotten about. That's why adding someone on Facebook is a serious transaction, and has the power to alter the way others see you. Who should I give that power to? Friends? Neighbors? Coworkers? Family members? Teachers? It's something I try to consider, and I've rejected friend requests because of it. That's why I don't blame my teacher for keeping his social media private - he knows what power it has and acts accordingly.



Case for the Classroom

Claire Leibowicz is an incoming senior at Harvard University.

“**Claire**, do you still think you may want to be a professor?” my friend asks me as we pick at our lunches in the dining hall. We planned to have lunch together, but we’re accompanied by our laptops. I’m vigorously typing away at a paper, while she’s live-streaming her history lecture. “Possibly. Why do you ask?”

My friend goes on to explain her latest theory: the Internet is going to totally disrupt teaching and eliminate the need for in-person university classes taught by professors. “Look,” she begins, “as I sit here listening to my professor analyze the role of women during the Civil War, I’m simultaneously on Wikipedia looking up individuals he references, a different scholar’s opposing ideas about how women were involved in the war, and even clicking through *another* lecture by *another* American history scholar from *another* university...while eating my lunch. And even if I went to class, I’d probably be doing the same thing. Why do we even have to include official class times and lectures when I have access to all of these materials and can just engage with them on my computer?”

My visceral reaction to my friend’s suggestion involves me scrunching my face in disbelief, but she has a point. It’s true, the Internet provides troves of information beyond anything that one professor can offer in one hour time slots over the course of a semester. Whether videos as MP4s, notes as PDFs, or thoughts as Reddit comments, these digitized bits of information in all their glory combine the knowledge and opinions of individuals from the entire world, all in one place, wherever and whenever I want to access them.

So why did I have my visceral reaction to my friend’s question? And the more I thought about my friend’s theory in the context of my own education, why was it that I rarely watched lectures retroactively or live-streamed? And why would I try to use my laptop without WiFi while in the classroom attending lecture?

Perhaps it is because there is something very different about witnessing a professor’s passion for his or her subject in person, communicated through vocal inflection or behavioral subtleties, that can’t be experienced the same way through a video as in the actual classroom. Or it might have to do with the fact that when my friend’s history professor realizes he used a pun when describing the Battle of Fort Sumter and the class realizes it too, the students in attendance who are focused purely on the lecturer in front of them experience it very differently than my friend who is simultaneously eating and researching amidst the bustle of the dining hall.

A quote offered by Dan Geer, the chief information security officer for In-Q-Tel, to my computer science class provides perspective on the fusion of technology and education: “Just because technology can be used to solve some problem or make something better, doesn’t mean that it should be.” Agreeing with Geer in the context of education by no means labels one a Luddite, just an individual aware of the potential negatives of technology in higher ed. While it is true that MP4 videos and Wikipedia articles can supplement my learning experience in the classroom, they should not detract from or totally supplant traditional teaching methods that developed without more sophisticated technologies.

Research has further supported my classroom observations. Just because I can e-mail and Wikipedia search all of my professor’s journal articles during a lecture—whether in person or while live-streaming—doesn’t mean that this will truly improve my knowledge. A 2003 study out of Cornell University suggests that regardless of the kind or duration of computer use, students who disconnected from their laptops did better on post-lecture quizzes—perhaps relating more to the hazards of multitasking than the unique way the Internet will change teaching,

but still an important conclusion.⁵ So whether my friend peruses her Facebook News Feed or attempts to learn everything there is to know about the Civil War thanks to Google, she would do better disconnecting from these tools while watching the lecture, in person or live-streamed.

Call me old fashioned, but research and my experiences imply that technology should be integrated into the classroom with caution. There is something unique about the in-person classroom experience, whether due to a professor's mannerisms and insights or the shared interaction with peers, that should be enhanced but not replaced by technology. So yes, I still may want to be a professor. And I would hope that one day my students come and pay attention in class, because there is a lot more for them to learn from me than what is conveyed through a video, lectures slides, or published papers.

5 Hembrooke, H., & Gay, G. (2003). The Laptop and the Lecture: The Effects of Multitasking in Learning Environments. *Journal of Computing in Higher Education*, 15. Retrieved July 29, 2015, from <http://www.ugr.es/~victorhs/gbd/docs/10.1.1.9.9018.pdf>.



Opting Out: Ignorance, Not Consent

Jeremiah Milbauer is a rising freshman at The University of Chicago.

Almost everyone I know has, at some point, googled themselves. Whether by the newsworthiness or by the uniqueness of our names (in my case, the latter), we've all bragged to each other about how high up we appear in the search pages for our names — or, in some cases, rebuked the accusations that we were an active poster on “My Little Pony” forums. Googling and trawling the internet for personal information has become an art, and I've often found myself surprised at the wealth of information about me or my friends that just sits on the first page of Google Search results. Sometimes it's a pleasant surprise, but more recently I've been shocked at how much information is actually available online. I grew up alongside “Web 2.0,” and while it was initially exciting to be able to share aspects of my life with the world, the increasing ubiquity of services that share information without explicit consent has made it difficult to have control over what aspects of my life, or what subsets of my personal information, make it onto the internet.

Your Privacy Choices

☒ **Do not share information about my credit worthiness with your affiliates for their everyday business purposes.**

Affiliates are companies related by common ownership or control. They can be financial and nonfinancial companies.

☐ Apply this choice only to me. If you have a joint account, your choice will apply to everyone on your account unless you select this box.

☒ **Do not allow your affiliates to use my personal information to market to me.**

☐ Apply this choice only to me. If you have a joint account, your choice will apply to everyone on your account unless you select this box.

☒ **Do not share my personal information with nonaffiliates to market their products and services to me.**

Nonaffiliates are companies not related by common ownership or control. They can be financial and nonfinancial companies.

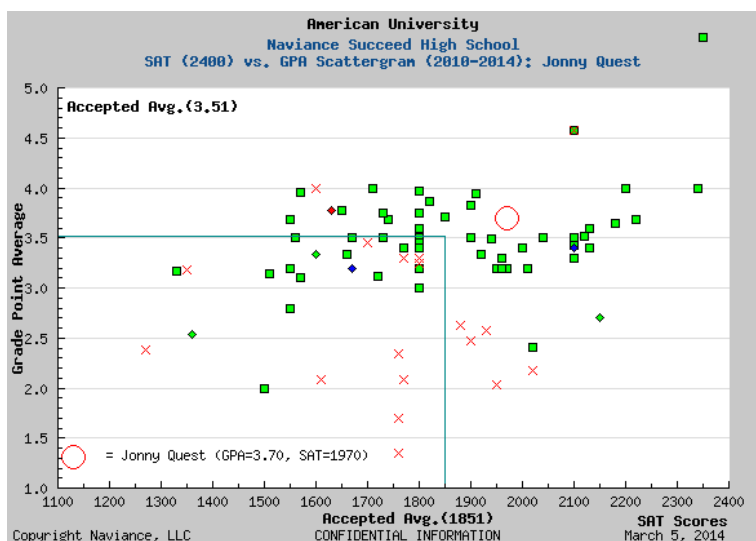
☐ Apply this choice only to me. If you have a joint account, your choice will apply to everyone on your account unless you select this box.

When I signed up for my first checking account very recently, I was surprised to see that my bank automatically opted me in to sharing my personal information. I had to manually check a box telling them not to share personal data with their “nonaffiliates”

I, along with most Internet users, am losing the ability to decide which parts of my personal information appear online. Because vendors are slowly eliminating the option to prevent the collection or distribution of personal data, and because some services are so ingrained in cultural and administrative expectations, “opting out” has become practically impossible. Either through Facebook or Gmail or through the slew of web tools I've had to sign up for as part of school or to apply for college, huge amounts of information about me have been collected online over the past few years, and I have very little control over what portions of it are shared. For instance, on “Naviance” (a tool my school, along with 8,500+ others, uses to organize the data of over 8,000,000 students) my GPA, test scores, and college acceptance information is stored online.⁶

⁶ “Hobsons Data Sheet ActiveMatch.” [Naviance.com](http://www.naviance.com/docs/hobsons_data_sheet_activematch.pdf). Accessed June 26, 2015. http://www.naviance.com/docs/hobsons_data_sheet_activematch.pdf.

Naviance can generate charts that convert that information into anonymous data points so that other students can see how they compare to past college applicants. Naviance even uses the data it collects to allow colleges to target specific students based on “state, ethnicity, year in high school, and GPA.”⁷



Although the information is anonymous, users are never given the option to decide whether or not it is shared with the world.⁸

Other vendors aren’t so generous as to anonymize the data: when you take the PSAT or the SAT and opt-in (at least they give you that option) College Board sends your information to colleges that have paid \$0.38 per name to receive them, and those schools send you information brochures based on what they receive.⁹ After taking the PSAT, the contents of my room was about 50% my stuff, and 50% college mail. With what seemed like more than 100 different institutions sending mail to me, my data alone might have enriched College Board by more than \$38. College Board and other information-sharers promise to only share my information in specific cases. But once the information has been released to third parties, those promises don’t carry over. Those recipient parties have a large amount of personal statistics and identifying information, and I no longer have control over where that info goes.

Maybe it’s naïve to think that I should decide what information about me is shared with the world. I grew up thinking that I could curate my online identity, but as social media and information sharing has become more and more popular, not-explicitly-consensual sharing has begun to spiral out of control. There’s a dissonance in the way many of these services work: by combining private tools (such as messaging applications, or administrative EdTech applications) with sharing tools (like data-driven social media, or analytic tools) it’s impossible to know when your “private” information is actually kept private, and who it has been shared with. Take Facebook, for example. Although not all users can see every post or every message, Facebook collects information on your public profile, posts visible only to friends, and private messages in order to compile internal user profiles. Those profiles allow Facebook to group together information about your personality, preferences, experiences, and even demographic information – and for Facebook, they are valuable assets. They help Facebook provide its users with better content, but more importantly, targeted advertisements. It’s also possible that sites like Facebook could be releasing this information to other organizations, like government agencies or researchers.

⁷ Ibid.

⁸ Naviance. (2014). *College Comparison Tools* [Illustrative Graph]. Retrieved from <http://www.naviance.com/college-and-career-readiness-platform/college-planning/college-planning-scattergrams-college-comparison>

⁹ “Pricing and Payment Policies.” College Board Search. Accessed June 26, 2015. <https://collegeboardsearch.collegeboard.org/pastudentsrch/support/purchasing/pricing-payment-policies>.

This doesn't have to be bad. There's a lot of potential for the use of data and preferential statistics. It would be great if high schoolers could learn, in detailed and anonymous statistical glory, the preferences of different college admissions committees. It would be great if people only got advertisements for the products they were interested in. But the fact is that right now, it doesn't seem like any of the current applications are advanced or ambitious enough to provide what they should. Most data-driven educational metrics are poorly conceived and fail to consider a vast number of education variables, even though they have the potential to be powerful tools. Furthermore they do not sufficiently protect users private data. I have to blindly trust that sites like Facebook are keeping my data anonymous and protected against hackers. There is an unbalanced trade. Personal information is valuable (I'm worth anywhere from \$7 to \$15 to Google and companies like it that capitalize on the data I provide them)¹⁰ but it's being given away for not enough in return. But at the moment it seems like there just isn't any benefit. I still get pointless or embarrassing advertisements, what large-scale data analysis I'm a part of is mostly useless, and all the while information is being collected on me. I'd rather ditch the major costs along the minor benefits than allow my personal information to be collected. More and more, however, I feel like I'm forced to use tools (like Facebook or Naviance) that give unsatisfactory options for those wishing to opt-out of data collection. I've turned to third party applications, such as Ghostery or Disconnect, to block advertisers from tracking and using my data on the web. Still, I'm forced to send private messages through websites that openly sell information on their users.

If we continue yielding to the growth of information sharing, we're letting our own expectations of privacy erode right in front of us. As modern technology begins to make its way into legislative agendas and courtrooms, our resignation cedes our legal safeguard (a "reasonable expectation of privacy") against invasive data gathering and data sharing. I feel very strongly that not only must legislators pass bills that bind information sharing to certain rules, but also consumers should work with policymakers to create formal standards and expectations for information collection and sharing. But until we can rate and patronize vendors based on what they do with our information, people should be able to completely opt-out of their information being shared.

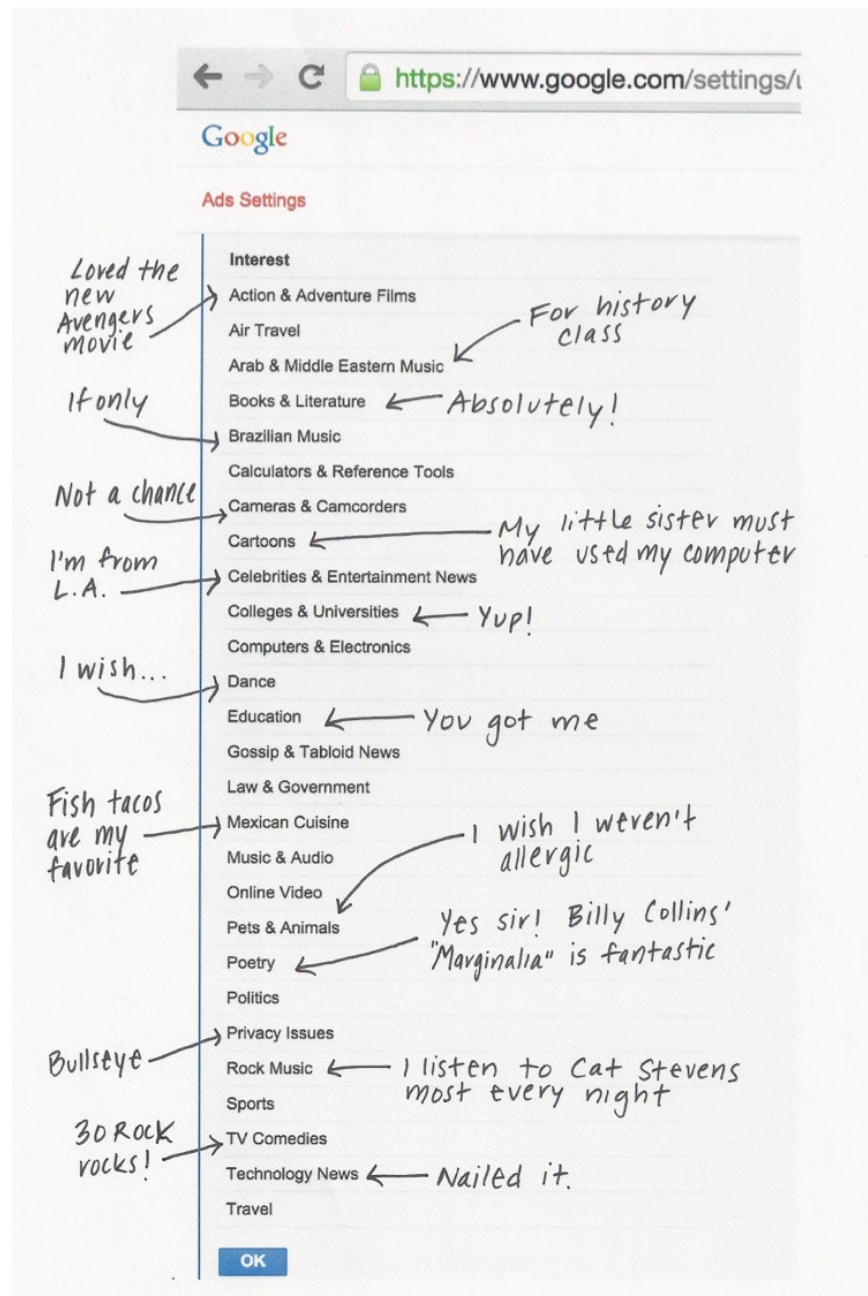


10 Louis, T. (2013, August 31). How Much Is A User Worth? Retrieved July 29, 2015, from <http://www.forbes.com/sites/tristanlouis/2013/08/31/how-much-is-a-user-worth/>.

Newfound Interest: Practical ways of raising awareness

Hannah Offer is a rising freshman at Yale University.

CLICK. CLICK. Google is the master of search. It tracks our moves online and uses complex algorithms to predict our next click. Let's see how good they are. Below is their profile of my "interests":



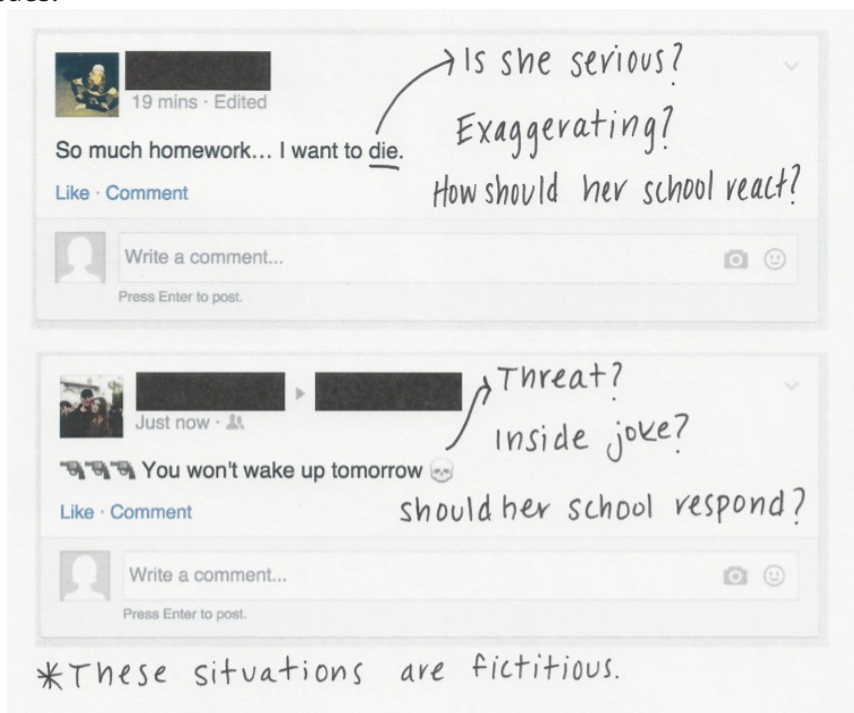
To see Google's profile of your "interests," check out your account settings.¹¹

¹¹ Account settings. (n.d.). Retrieved July 29, 2015, from <https://www.google.com/settings/u/0/ads/authenticated>.

The fact that Google closely monitors my activities online is not entirely surprising; after all, Google makes its money off ads targeted to users' ostensible interests. Much more shocking, however, was learning that many schools conduct similar surveillance of students—they install tracking software on school computers, read emails sent from school-issued accounts, monitor students' location and attendance with radio frequency identification chips, etc. Does my school know what Google knows?

Last summer, while working as an intern at the Berkman Center for Internet & Society, I clicked on the headline of a CNN article entitled, "California school district hires firm to monitor students' social media."¹² The article read: "A suburban Los Angeles school district is now looking at the public postings on social media by middle and high school students,¹³ searching for possible violence, drug use, bullying, truancy and suicidal threats." And Glendale is by no means the only district to conduct social media monitoring. The more I read, the more I saw how widespread student tracking has become across the U.S. (in Huntsville, Alabama;¹⁴ Chattooga County, Georgia;¹⁵ Jackson County, North Carolina;¹⁶ Washington County, Maryland;¹⁷ and Kent, Washington;¹⁸ among countless others) and how few students and families know about it.

I began to wonder: *How many schools do this? What do schools track and what do they do with this knowledge? And who determines the rules?* Curious, I asked my supervisor at Berkman to allow me to shift my focus to student privacy issues.



12 Martinez, M. (2013, September 18). California district hires firm to monitor students' social media - [CNN.com](http://www.cnn.com/2013/09/14/us/california-schools-monitor-social-media/). Retrieved July 28, 2015, from <http://www.cnn.com/2013/09/14/us/california-schools-monitor-social-media/>.

13 Ibid.

14 Stephens, C. (2014, September 24). Huntsville schools say call from NSA led to monitoring students online. Retrieved July 28, 2015, from http://www.al.com/news/index.ssf/2014/09/after_warning_from_nsa_huntsvi.html.

15 Wilder, K. (2014, July 18). County schools to track students using RFID, barcodes on ID cards. Retrieved July 28, 2015, from http://www.northwestgeorgianews.com/rome/news/education/county-schools-to-track-students-using-rfid-barcodes-on-id/article_027dd216-0e3f-11e4-b5b1-001a4b-cf6878.html.

16 Ellison, Q. (2014, July 22). School officials to monitor students' social media use. Retrieved July 28, 2015, from http://www.thesylvaherald.com/breaking_news/article_a04a7136-11b2-11e4-9e49-001a4b-cf6878.html.

17 Md. School System to Monitor Student Social Media Accounts. (2014, August 24). Retrieved July 28, 2015.

18 Chen, N. (2014, August 14). Kent School District monitors student Internet use. Retrieved July 28, 2015, from http://www.kirotv.com/news/news/kent-school-district-monitors-student-internet-use/ng3N7/#_federated=1.

I found that few standards exist to govern how schools monitor students. It's a gray area. On one hand, student tracking has some real benefits: it can help thwart violence or self-harm. At the same time, however, surveillance programs have the potential to restrict students' fundamental rights, such as free speech and privacy.

Schools have good intentions, but it's murky territory. We need a national discussion between students and school administrators to figure this out.

So how do we ensure student safety without jeopardizing students' freedoms? It's my goal to answer this question by creating a draft policy that provides guidelines for how schools and students can agree on monitoring practices.

This fall, I persuaded my school to let me conduct an independent study on the evolving history of student privacy and free speech in the U.S. Seeking a better understanding of existing legal precedents, I started with *Tinker v. Des Moines* (1969),¹⁹ which established students' First Amendment rights in public schools. *Tinker* remains one of the most-cited cases related to student expression online.

I am beginning the process of meeting with students, families, teachers, and administrators within my school community. By assessing their awareness of this issue, their concerns, and their ideas, I hope to find common ground. I want to ensure that everyone has a voice, especially students.

If it were up to me, the first step I'd take to solve this student privacy issue would be to increase the transparency of schools and monitoring firms. More openness and communication from administrators and officials would allow students and their families to better understand schools' monitoring practices.

I hope that my work can serve as a foundation, not only for my school's monitoring policy, but also for other schools and educational institutions, and contribute to a wider or national discussion about student surveillance practices.

While it's possible little could come of my exploration, it's amazing to think that a few clicks on the Internet could lead to a more candid and focused dialogue on student privacy.

¹⁹ *Tinker v. Des Moines Independent Community School District* 1969 (No. 21). 393 U.S. 503 (1969). fvcUnited States Supreme Court. Argued November 12, 1968. Decided February 24, 1969.



Breakthrough: Considering robots in the classroom

Zoe Wood is a rising senior at Columbia University.

The important and growing presence of technology in classrooms has given rise to some fear that education technology—a combination of applications, tablets, robots, smartboards, data analytics, and the like—will effectively replace traditional classroom teachers.²⁰ That said, this particular fear is dwindling, and I’ve found that when you Google “will tech replace teachers?” or something to that effect, it is hard to find a media outlet, blog, political official, or a teacher herself who reports that traditional educators will be replaced in the not-so-distant future by technology that can do the same thing better, or for less money. Many have written at length to dispel this fear, to advocate for the allowance of technology in many forms to continue to enter classrooms uninhibited by fear.²¹ Still there is one hugely important sector of elementary and secondary education currently undergoing what I find to be the most exciting transformation in the history of education technology. I think that this transformation causes the question of whether technology will replace teachers to demand new scrutiny.

“Autistic children may learn better from robots than from human teachers,” reported Judith Burns in a 2012 article for the BBC.²² This finding was based upon a then-emerging trial run at Topcliffe School, a primary school in Birmingham, England. Head teacher at Topcliffe Ian Lowe explained to Burns that “the robots have no emotion, so autistic children find them less threatening than their teachers and easier to engage with.”

Topcliffe uses a robot called NAO, created by the French robotics company Aldebaran. At Topcliffe, children play games with NAO to enhance both their social and academic skills. Games can be as simple as imitation routines: NAO raises his hand and the children learning from him raise theirs; NAO touches his toes and the children do the same. NAO can also play vocabulary games with children during which he calls out the name of an animal and a student holds up a corresponding picture. If the student is correct, NAO will whirl and cheer, flash its eyes and raise its arm.²³ Alternatively, if the wrong picture is produced, NAO takes on a subdued posture and urges the student gently to try again. NAO does not possess notions such as personal space, so if a child thrusts a photo in its face during a matching game, NAO does not flinch and in turn further confuse and alienate the student as human teacher would likely do in the same situation.

Recently, NAO has also been introduced at The Moody School in Haverhill, Massachusetts as part of Aldebaran’s Autism Solution for Kids Initiative, which the company launched last year out of its office in Boston. NAO has experienced similar success to Topcliffe in the year that it has spent at the Moody School and the three other schools which have benefited so far from Aldebaran’s initiative.²⁴

The articles that describe NAO’s success in special needs classrooms are overwhelmingly positive, understandably so; NAO is responsible for leaps in social and academic progress among students at Topcliffe Primary and at the Moody School. Its success rate is reportedly astounding. But I cannot help but remark upon the difference in tone

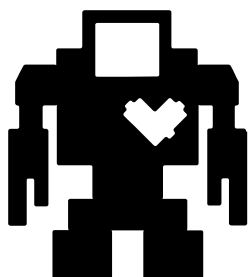
20 Reich, J. (2014, July 8). Will Computers Ever Replace Teachers? - The New Yorker. Retrieved June 16, 2015, from <http://www.newyorker.com/tech/elements/will-computers-ever-replace-teachers>.

21 Trucano, M. (2015, February 24). Will technology replace teachers? No, but ... Retrieved June 16, 2015, from <http://blogs.worldbank.org/edutech/tech-and-teachers>.

22 Burns, J. (2012, November 8). Robots in the classroom help autistic children learn. BBC. Retrieved June 11, 2015, from <http://www.bbc.com/news/education-20252593>.

23 Griffiths, A. (2014, February 14). The robot teacher connecting with autistic children. The Telegraph. Retrieved June 11, 2015, from <http://www.telegraph.co.uk/technology/news/10632937/The-robot-teacher-connecting-with-autistic-children.html>.

24 Borchers, C. (2014, June 14). NAO from Aldebaran Robotics connects with autistic children. Boston Globe. Retrieved June 11, 2015, from <https://www.bostonglobe.com/business/2014/06/14/nao-from-aldebaran-robotics-connects-with-autistic-children/10FpLVqBk4wPsK0q21kxDI/story.html>.



between these articles and those that describe the advent of ed tech to traditional classrooms, which generally carry a more sober, questioning tone. More than anything, I am curious about how the schools that have already benefitted from NAO have introduced the tool to parents and teachers, whether there has been pushback, and for what reasons. If the use of the robots in special needs classrooms is truly to become mainstream—and due to the reportedly astounding success rate, I hope that it does—then I believe it will be hugely important for the early adopters to publicize as best as possible the entirety of their experience so that those who come later are not blindsided by its challenges.

Although the first, NAO is not the only robot currently in use to educate children with autism spectrum disorders.²⁵ In 2013, Robokind Robotics partnered with the University of Texas and the Dallas Autism Treatment Center to create Milo, a child-like robot which has been used not only in the treatment of autism but in diagnosis as well. Traditionally, diagnosis of child autism takes place through social interaction and speech exercises, and therefore typically cannot happen until a child is able to speak. This is problematic because the sooner a child is diagnosed, the more effective his treatment. Thus Milo, with its ability to interact with children through consistent and measured body movements and facial expressions, is able to succeed at early autism diagnosis where humans cannot. And Milo is set apart from even NAO in its ability to make ‘facial expressions,’ which arguably lends Milo even more potential to prepare children with autism for social interactions.

Romibo is a third in the ranks of educational robots. Unlike NAO and Milo, it is not at all anthropomorphic, rather, it resembles a small, fuzzy mound with antenna. Still, Romibo has a screen that displays expressive eyes, and it is able to track eye contact. Developed by Origami Robotics at a National Science Foundation research and engineering laboratory,²⁶ Romibo was designed to be affordable. While NAO and Milo cost \$5,000 and \$7,990, respectively, Romibo is currently \$698 and its creators are working to drive its price down to between \$200 and \$300.²⁷ Romibo has not been quite as extensively documented in mainstream media as NAO and Milo, however, the *Autism Daily Newscast* reported in 2013 that “Romibo plays several games, including I-Spy, Tell me a Story, and Simon Says,” which are designed to teach children basic academic and social skills.

“Something very special happens when you put a machine and person together,” Maja Mataric told *Robotics Business Review*.²⁸ Mataric says that she would like to see robots not only in classrooms but on playgrounds as well. “Imagine if you had these robots who are buddies of kids with autism. I bet that all the kids will be fascinated, and suddenly you have a very natural social link, and the robot can be teaching all the kids things.” However, she cautions that it is not exactly clear why robots are so effective in the education of children with autism spectrum disorders because autism itself is so complex.

Robots have begun to do what teachers simply cannot: connect successfully and consistently with students who have autism spectrum disorders. While tablets, robots, and online classrooms may attempt to aid human teachers in mainstream classrooms when budgets are cut, or when a class is too large for a teacher to manage independently, technology is coming to be viewed as an *essential* component of the education of students with autism. It seems predictable to me that, when put in the context of the fear that human teachers will become obsolete in the face of technology, this success would be threatening. It seems strange that there is very little

25 Tucker, E. (2015, February 1). How robots are helping children with autism. The Guardian. Retrieved June 11, 2015, from <http://www.theguardian.com/lifeandstyle/2015/feb/01/how-robots-helping-children-with-autism>.

26 Origami Robotics - Robots for Autism. (n.d.). Retrieved June 25, 2015, from <http://origamirobotics.com/>.

27 Joss, L. (2013, July 9). Romibo - Researchers Seek Funding for Affordable Therapy Robot - Autism Daily Newscast. Retrieved June 16, 2015, from <http://www.autismdailynewscast.com/romibo-researchers-look-for-affordable-therapy-robot/715/laurel-joss/>.

28 Shein, E. (2012, April 18). Robots May Help Kids With Special Needs. Robotics Business Review. Retrieved June 11, 2015, from http://www.robotics-businessreview.com/article/robots_may_help_kids_with_special_needs.

public dialogue regarding concern for special education teachers becoming obsolete, or other, broader concerns about the use of robots in the education of children with autism. spectrum disorders.

Though any public concern for the replacement of teachers in mainstream classrooms is largely misguided, I think that the concern is positive in that it forces scrutiny of the way in which technology is integrated into classrooms, and at what cost. Resistance to technology's introduction into classrooms in response to the fear that teachers will play a less prominent role – although I believe it to be most often excessive – helps to keep education technology honest and staid in its application. Conversely, I find the apparent lack of criticism of tablets and robotic technology in special needs classrooms to be potentially worrisome. The breakthroughs that the integration of robots like NAO and Zeno have made are truly that: breakthroughs. Unlike in more traditional classrooms where technology has been helpful in important but smaller ways—augmenting test scores by a few points, aiding teachers in the management of large classes—the use of technology in special needs classrooms has been revolutionary, and it is hard to criticize the mechanisms of unprecedented results.

Still, these breakthroughs are relatively recent. Students at Topcliffe primary and the Moody School have known NAO for only a year or two, not to mention that NAO and robots like it are currently so expensive that it may be some time before they are used widely in public education, so it is likely that the excitement simply has yet to subside and, when it does, I'm hopeful that reevaluation and skeptical public dialogue will follow. It is also important to remember that special needs classrooms do not stand on their own – they are most often part of a larger educational system and thus do already factor into public dialogue more generally speaking.

Moreover, in many cases of children with autism spectrum disorders, the ultimate goal is to integrate the child into a mainstream classroom when possible, as stated by the headmaster of Topcliffe. This illustrates the fact that human teachers remain the ideal, even as robots and iPads outdo human teachers in the breakthroughs required to equip autistic children with the education they require. As Carl Clement, an Aldebaran Robotics developer who has worked on NAO, said, “as they feel more confident, they move on to the next person, who this time may be real.”²⁹

²⁹ See Griffiths, *supra* note 22.

