

Article

The Platformization of the Classroom: Teachers as Surveillant Consumers

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Abstract

Technology platforms, including learning management systems and monitoring tools, have taken root in schools. While seen as bringing efficiency or innovation into classrooms, they also offer greater capacities for surveillance. Drawing on findings from focus groups with teachers in the US, we explore how teachers' use of technology platforms produces surveillance. We argue that this positions teachers as surveillant consumers who use monitoring as a way to fulfill their responsibilities to students. We portray two configurations of monitoring in the classroom: tracking student learning and keeping students on task. These configurations reveal how technology platforms orient teachers to see student data as interchangeable with students, which we believe highlights the need for greater scrutiny of technology platforms' role in the classroom.

Introduction

As in many aspects of everyday life, technology platforms have taken root in schools (Education Week 2017). Students may type assignments on a netbook, play math games on a tablet, or take tests on computers. Teachers may organize instructional materials in an online classroom space, track grades in a learning management system, or check a student's web browsing history via a monitoring tool. Technology platforms, particularly those used in workplace contexts, enable interoperability between different systems (Ajunwa and Greene forthcoming). This ability to streamline data collection and aggregation is often welcomed as a harbinger of efficiency (Ajunwa and Greene forthcoming), but it also brings greater capacities for surveillance (Lupton and Williamson 2017; Zuboff 2019).

In this paper, we explore how teachers' use of technology platforms produces surveillance and positions teachers as what Stark and Levy (2018) call "surveillant consumers" who see platforms as useful tools to help them fulfill their job responsibilities. We show how teachers harness elements of Google's educational platform to achieve practical omniscience into their students' learning and behavior. We also consider how their use of this platform encourages them to focus on student data rather than students themselves.

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Below, we describe the role that technology platforms increasingly play in schools and review existing perspectives on school surveillance. We briefly explain our data collection and analysis methods before portraying two configurations of platform-supported monitoring in the classroom: tracking student learning and keeping students on task. We conclude with a discussion of how our findings extend understandings of the surveillant-consumer subject position and point to the need for greater scrutiny of technology platforms in the classroom.

Technology Platforms in Schools

Technology platforms increasingly mediate people's interactions in commercial, social, political, cultural, professional, and educational contexts. The emerging field of platform studies focuses primarily on how programmable systems of hardware and software support user-generated creative activity while also generating revenue for the companies that own the systems (Plantin et al. 2018). For example, Gillespie (2010) unpacked how Google frames YouTube as a neutral space that empowers users, absolving itself of responsibility for how people use YouTube even while profiting from their activity. This approach focuses on platforms as media, but platforms operate differently in other contexts, such as the workplace. Social media platforms generate revenue through targeted advertising, while work platforms tend to follow the more straightforward business model of charging employers for the technology. Additionally, employees are often required to use the platforms their employers have selected (Ajunwa and Greene forthcoming).

The rise of technology platforms in schools has obvious implications for students and their learning, but it also affects teachers and their jobs. For example, teachers use learning management systems to create spaces for different classes, share course materials, collect assignments, post grades, host discussions, and more (Singer 2017). From this perspective, educational technology platforms are platforms for work. One platform in particular dominates American classrooms: Google. More than half the nation's schoolchildren use its software, and its Chromebooks account for more than half of the mobile devices sent to schools (Singer 2017). Businesses often adopt platforms because they believe doing so will maximize profits (Ajunwa and Greene forthcoming). Indeed, the promise of cost-savings drew school districts to Google products (Singer 2017). However, schools also turn to educational platforms for social goals, such as to improve student learning (Crooks 2017) or, quite simply, to achieve "progress" (Finn 2016). In this paper, we focus on how such platforms also facilitate surveillance.

Surveillance in Schools

A teacher's job includes facilitating student learning and maintaining an orderly classroom; documenting student activities helps them accomplish both (Gallagher 2010; Sparman and Lindgren 2010). The entry of computers and the internet in schools offered teachers, school leaders, corporations, and government actors greater visibility into students' activities, reconstructing the classroom as a site of electronic surveillance (Steeves 2010). As other digital technologies take hold in schools, surveillance diffuses. Learning management systems integrate student work, grades, attendance, and more (Nemorin 2017). Social media, mobile apps, and physical activity trackers become sources of data or conduits through which data can be distributed to students, teachers, and parents (Lupton and Williamson 2017; Nemorin 2017). These data feed into the practice of learning analytics in which student data is aggregated and mined to predict student progress (Lupton and Williamson 2017).

Platforms facilitate this process in part because of their interoperability (Ajunwa and Greene forthcoming). Educational applications can be integrated into other systems and vice versa. For example, teachers can embed Google Drive into the Canvas learning management system (Hallmark 2017) or integrate various third-party apps into Chromebooks (Wong 2019). These integrations enable data from Canvas and third-party apps to flow into Google's domain, giving Google greater visibility into how teachers and students use its platform.

Within such milieus, students may engage in self-surveillance (Lupton and Williamson 2017), producing anxiety (Drew and Gore 2016) or satisfaction (Finn 2016). Some students may notice surveillance but feel it does not affect them, while others may feel targeted or pressured to conform to social norms (McCahill and Finn 2010). Students and teachers may perceive technologies like CCTV as “no big deal,” symbolizing surveillance but not convincingly enough to prompt behavior change (Nemorin 2017: 249). Conversely, students and teachers may perceive systems such as high-stakes standardized testing as surveillance and resist it by cheating (Gilliom 2010). By aggregating various pools of data, platforms may facilitate even more granular surveillance.

Our interest in this paper is to explore how teachers’ use of technology platforms, particularly products within the Google ecosystem, produces surveillance. In particular, we consider how this affects the teacher-student relationship. Stark and Levy (2018) observe that surveillance has become a normalized component of relationships and that people are encouraged to integrate surveillance technologies into their interactions with others. They offer two configurations of the surveillant consumer: the consumer-as-observer who fulfills caregiving responsibilities by watching over others and the consumer-as-manager who gives feedback to evaluate workers who provide services. We build on their theorizing by exploring how teachers take on the surveillant consumer position as they use technology platforms to monitor students.

Data and Methods

As part of a larger project on how elementary school children conceptualize privacy online, we conducted focus groups with 25 teachers in the US (Kumar et al. forthcoming). The topic of monitoring students came up in seven of our nine focus groups, and we asked follow-up questions when participants mentioned it. To analyze the data, our team conducted structural coding (Saldaña 2013) on the transcripts and clustered quotes by topic. We then conducted two rounds of thematic analysis (Saldaña 2013) on quotes about the topic of student monitoring.

In this paper, we discuss the two configurations of platform-supported monitoring that came up in our focus groups: tracking student learning and ensuring students stayed on task. While several participants described similar practices, we provide extensive quotes from two teachers who spoke in great detail about their monitoring practices. We illustrate these configurations and analyze how they position teachers as surveillant consumers (Stark and Levy 2018).

Tracking Learning through Datafication

The belief that datafication is key to improving student learning has captured the imagination of the education sector, particularly in charter schools (Crooks 2017). One focus group participant, Maryam, a pre-kindergarten teacher at an urban elementary public charter school, described the extent to which datafication imbues her teaching practice:

Numbers [are] everything to us as a school. So, we track everything [in Google Sheets]. Like for math, let’s say the eight standards times 20 students, that’s 160 assessments. We start the year. Then we start to teach them and then re-assess them again. So, we log the data and then we compare. How did they learn? How did I teach that standard? And we analyze the data. This is the teacher’s responsibility. Let’s say 80% of the students got it. 20% did not get it. How do I get them to count to ten? Well, we were counting in the line, we were counting waiting for the bathroom, we were counting on the carpet, counting during transition, counting to go to the bathroom.

All these things, I have to list them. So, we have to update also all the time. If I was doing something and, all of a sudden, I found that child is counting to ten, I have to go ahead and put it in the system. It’s crazy. It’s, oh my goodness, it’s all the time: numbers, numbers,

numbers. I have numbers in my dreams. And then, this is how we decide if they're ready to [go to] kindergarten or if they have to stay behind, based on data.

Maryam's school developed education standards based on national Common Core standards,¹ and teachers document student progress in Google Sheets, a spreadsheet application within Google Drive. Maryam has to determine whether students demonstrated proficiency on each standard, enter data manually, and figure out how to move lower-performing students toward proficiency. Like some of Crooks' (2017) participants, she sees these data as representing students and playing a critical role in decision making. These data are also visible to others—they feed into student portfolios for parents and were accessible to Maryam's teaching coach, who supports efforts related to data-driven instruction:

Based on data, we can create three or two classrooms. They can be three balanced classrooms based on data, race, gender, and everything. We go to this meeting toward the end of the year ready with the data. So, we say these are the high students in my classroom, these are the medium, [and] these are the low students—just to make sure not to put all the high [students] together or all the low together based on data that we provide.

In parent-teacher conferences, we create portfolios for each single student. We [can] take a screenshot from that piece of data to share with parents because they need to know, at least, how did [students] start the year and the progress throughout term one. And that also shows in the report cards for each single standard, each single subject, even social and emotional, we have standards for that, [which] come from the Common Core.

I think it's cool, it's working. We have our grade-level team meeting and our coach will come over [and] say, "Oh, your data looks beautiful. Oh, whatever child made really-, I can see the progress." So, it's a beautiful tool that everyone can have access [to]. You don't have to really bring all these papers. Everything is in the system. Your coach has access; when I have my coaching meeting, she knows what I'm talking about. It's [a] really accessible and easy tool.

Maryam's job responsibilities include collecting and analyzing data to ensure students meet her school's educational standards. The task is all-consuming, chasing Maryam even as she sleeps. But the Google Sheets through which she manages this task are an "accessible and easy tool," a convenient way to track data and share them with colleagues and parents. Like Stark and Levy's consumer-as-observer, Maryam's goal "is represented as practical omniscience: it is both [her] duty and desire" (Stark and Levy 2018: 1207) to track student progress.

Behavioral Accountability at the Expense of Privacy

Schools are a classic site for studying the use of surveillance to discipline people into appropriate behavior (Gallagher 2010). Datafication not only expands capacities for surveillance in schools, but it also raises significant privacy concerns (Lupton and Williamson 2017). Another focus group participant, Alison, a fifth-grade teacher at a suburban public elementary school, described how gaining visibility into students' online activities helps her keep students accountable:

We used a Chromebook management tool called GoGuardian. It allows the teacher to log in and see everybody's Chromebook. You can close out tabs if students are on the wrong thing. We just got that [at] the end of last year because there were so many issues with kids doing things on Chromebooks, so [school district leaders] finally figured out that we needed this, so they had to purchase that.

¹ See <http://www.corestandards.org/> for information about Common Core.

After every session is done, let's say the session is the whole day, [GoGuardian] will send me an email with the data from that session: what websites [students] were on the most, nothing about the specifics of what they were doing, but just what the kids were doing, when they were logged on, when they were logged off. I can go on individually by each student.

It actually lets you go back in time and see the screen of, let's say, at 3:40 p.m., they were on SportsIllustrated.com and clearly are not supposed to be there. I can take a picture so I have evidence. If it's a first offense, I won't do anything with it, but if it happens often, I can send it to the parents, send it to the principal. It's clear proof, it's easy. I mean I could do that before GoGuardian as long as someone tattled on them. I could screenshot their [browser] history. They don't quite know how to delete their history. Some do, but most don't.

Alison's district experienced so many "issues" with its one-to-one device program (where schools give each student a netbook or tablet) that it purchased GoGuardian. This software integrates with Google Chromebooks and gives teachers the ability to remotely view students' Chromebook screens, close browser tabs, chat with students, and see students' browsing history. Alison shows her students that she possesses these capabilities, but she also distributes some of this power to hold "everyone accountable" by displaying all students' screens on the board, promoting a form of social surveillance (Marwick 2012).

The day we got [GoGuardian], I put it on the smart board. [The students] are like, "Wait, what's on—?" They were all figuring it out, and I was like, "Oh yes." I could stop everyone's screen. Or, I could send people individual messages and lock individual screens and say, "Hey, you're on the wrong site." They were freaking out. It was really fun. But then after that day, they were like, "Oh crap. I need to make sure I'm not doing the wrong thing because [the teacher] could see it." I told them right away because why would I want to get them all in trouble? I just tell them, "Hey, now I'm looking, so don't do anything wrong." I thought it was hysterical to see them panic that now I'm watching them. . . . No one, no one did anything wrong for the rest of the year. The whole year.

[Once] we were working on the Chromebook, [students] were creating their presentations [for an end-of-year career fair], and I would leave up the screen that had all the thumbnails of what website they were on. 'Cause when we do research projects, we give them all the resources they need in a LiveBinder. So, they should only be on the websites from the LiveBinder. So, we can all see everyone's screen. Their career projects aren't private. Everyone knows what they are doing. It was helpful. Obviously, there would be instances when I wouldn't want it—if it was a test or [they're] writing something. But it held everyone accountable, and I didn't have to look at it.

With GoGuardian, Alison could discreetly observe her students' online activities and, more important, retroactively monitor them. The software offers "clear proof" of misbehavior, and Alison retains authority to show this "evidence" to parents or school leaders if necessary. Just as with some of Crooks' (2017) participants, Alison saw data as stand-ins for students rather than as traces that could be pulled out of context.

Alison takes pleasure in demonstrating these monitoring capabilities to students, framing surveillance as a form of productive power (Hornqvist 2010) that enables students to stay on task. During the focus group, she did not register her ability to take a granular look at students' browsing history as a privacy concern, only mentioning privacy with regard to displaying students' screens on the board. Even then, she considers privacy as it relates to student data rather than the students themselves. Echoing Stark and Levy's (2018: 1207) consumer-as-observer, Alison's use of GoGuardian affords her "practical omniscience" into students' online activities, helping her keep students out of trouble. Furthermore, her displaying students' screens on

the board puts students in the role of consumers-as-managers, letting them feel empowered to watch each other.

Embracing the Surveillant Consumer Position

Certainly, not all schools track student progress as granularly as Maryam’s, and not all teachers embrace monitoring software as eagerly as Alison. Yet, data-driven decision making has taken root within education (Marsh, Payne, and Hamilton 2006), and GoGuardian (2018) reports that 4 million students across 2,300 US school districts use its software. The monitoring practices afforded by these platforms—Google Sheets for Maryam and Chromebooks plus GoGuardian for Alison—produce various types of surveillance. Maryam creates data about students in Google Sheets to document their progress against learning standards. Alison receives data about students from GoGuardian to keep them on task and accountable for their behavior. Comparisons between GoGuardian and the Panopticon’s all-seeing eye are hard to ignore, but we also see Alison marshalling students to engage in social surveillance, watching each other.

These different modes of surveillance position teachers as surveillant consumers. Watching students, whether to document their learning or keep them on task, is part of teachers’ responsibilities, and technology platforms are instrumental in helping teachers meet them. The tasks themselves may appear burdensome (recall that Maryam described needing to make 160 assessments several times per year for mathematics alone), but technology platforms make them easier. While some teachers may find surveillance technologies to be “no big deal” (Nemorin 2017), Maryam and Alison were quite upbeat in their comments. Both appear to have accepted surveillance as “normatively essential to duties of care” (Stark and Levy 2018: 1207), even though monitoring is not the only way to document student learning or keep students on task.

In her critique of Google’s dominance in education technology, Singer (2017) identified teachers as one reason for the company’s rapid growth in the classroom. Google created online communities, training programs, and education conferences to familiarize teachers with its platform. Though neither Maryam nor Alison mentioned participating in these activities, they also did not question Google’s presence in their classrooms. They appeared to regard the elements of its platform as mere tools that made their jobs easier rather than as part of a larger configuration that normalizes datafication and surveillance over other modes of interaction. This configuration is complex, involving technology companies that see people as programmable sources of revenue (Zuboff 2019) and an education sector that sees technology as the key to addressing inequality (Crooks 2017). Against this backdrop, it is perhaps unsurprising to see Maryam and Alison embody the surveillant consumer role.

Eliminating Friction and Flattening Students into Data

The surveillant consumer role exists within a culture that frames lack of information as a threat (Stark and Levy 2018). Surveillance is not only a way to neutralize the threat but also a means for people to fulfill their caregiving responsibilities. Stark and Levy (2018) illustrate this by describing rhetoric surrounding parental supervision of children: Parents should know what their baby is doing right now. Putting a camera in the baby’s crib not only generates this necessary information but also labels them as “good” parents. In our case, platform-supported monitoring gives teachers information about what their students are learning and doing, helping them be “good” teachers.

We argue that platforms lie at the heart of what makes this behavior “good,” in part because platforms reduce friction. Maryam and Alison could monitor their students without using a technology platform, but using a platform makes monitoring easier. Maryam’s laptop with Google Sheets is a “beautiful tool” through which she can enter data, take screenshots, and share access to her files. Alison’s placement of GoGuardian’s God’s-eye view of student Chromebooks on a screen at the front of the classroom “held everyone accountable and I didn’t have to look at it.” Surveillance-driven platforms like Google “pursue the elimination of ‘friction’ as a critical success factor” (Zuboff 2019: 241).

Beyond streamlining practices of monitoring, the use of technology platforms also flattens students, representing them as one-dimensional units within a uniform interface. A spreadsheet prioritizes standardization over nuance, inviting users to tabulate performance rather than explain it. Screenshots of a browser spotlight activity over context, showing website visits associated with a particular user account but lacking details on who did the visiting or why. Platforms do not necessarily preclude a teacher from finding out or including such details. However, by foregrounding student data and representing students uniformly, whether as spreadsheet columns or browser windows, platforms may entice teachers to equate their practical omniscience with knowledge of their students, collapsing the categories of student data and student.

In Maryam's and Alison's comments, we see their attention drawn toward data *about* student learning and behavior rather than the learning and behavior itself. Maryam needs her students to count to ten *so that* she can document their progress in her spreadsheet. Alison needs to use GoGuardian *so that* she has evidence that a student veered off task. Student learning and behavior, rather than being ends themselves, become means to produce data. These data then inform decisions that affect students, such as what classroom Maryam's students get assigned to or whether Alison's students get in trouble. Such decision making is neither linear nor automated; Maryam and her colleagues can balance their classroom according to different criteria (e.g., race, gender, educational performance), and Alison can refrain from contacting a parent or principal if a student committed a first offense. But data play an increasingly central role in such processes. Maryam and her colleagues make decisions "based on data," and Alison retains data to serve as "clear proof" of student wrongdoing. Left unclear is the extent to which students, or their parents, have a say in these data about them.

Conclusion

The paradigm that datafication is key to improving and enhancing human experience has been embraced since Google discovered that analyzing digital traces at scale could predict people's behavior and generate immense profit (Zuboff 2019). It has spread well beyond Google, animating other technology platforms, industries, and sectors, including education (Crooks 2017; Marsh, Payne, and Hamilton 2006). In this brief paper, we described two configurations of platform-supported monitoring in classrooms: tracking student learning and keeping students on task. The platformization of the classroom does not cause teachers to monitor their students. Rather, it reduces the friction involved in monitoring and frames monitoring as an attractive method through which teachers can perform their duties. This positions teachers as surveillant consumers, gathering information for use in future decision making. Ostensibly, teachers use monitoring to foster educated, well-behaved students. But Maryam's and Alison's comments suggest the value of platform-supported monitoring may lie in its ability to *generate data* about educated, well-behaved students. Classroom activities should center on students, rather than their data, and we hope these findings inspire deeper interrogations of the role that technology platforms play in the datafication of education.

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References

- Ajunwa, Ifeoma, and Daniel Greene. Forthcoming. Platforms at Work: Automated Hiring Platforms and Other New Intermediaries in the Organization of Work. *Research in the Sociology of Work*.
- Crooks, Roderic. 2017. Representationalism at Work: Dashboards and Data Analytics in Urban Education. *Educational Media International* 54 (4): 289–303.
- Drew, Debbie L., and Jennifer M. Gore. 2016. Measuring up? The Discursive Construction of Student Subjectivities in the Global Children's Challenge™. *Sport, Education and Society* 21 (3): 374–395.
- Education Week. 2017. Data Dive: Devices and Software Flooding into Classrooms. June 12.

- <https://www.edweek.org/ew/tc/2017/data-dive-devices-and-software-flooding-into-schools.html?intc=EW-TC17-TOC> [accessed November 29, 2018].
- Finn, Matt. 2016. Atmospheres of Progress in a Data-Based School. *Cultural Geographies* 23 (1): 29–49.
- Gallagher, Michael. 2010. Are Schools Panoptic? *Surveillance & Society* 7 (3/4): 262–272.
- Gilliom, John. 2010. Lying, Cheating, and Teaching to the Test: The Politics of Surveillance under No Child Left Behind. In *Schools Under Surveillance: Cultures of Control in Public Education*, edited by Torin Monahan and Rodolfo Torres, 194–209. New Brunswick, NJ: Rutgers University Press.
- Gillespie, Tarleton. 2010. The Politics of “Platforms.” *New Media & Society* 12 (3): 347–364.
- GoGuardian. 2018. See What Others are Saying about GoGuardian. <https://www.goguardian.com/success-stories.html> [accessed November 15, 2018].
- Hallmark, Erin. 2017. Canvas Release: Google Apps LTI. *Canvas*. January 5. <https://community.canvaslms.com/docs/DOC-8732-canvas-release-google-apps-lti> [accessed January 24, 2019].
- Hornqvist, Magnus. 2010. *Risk, Power, and the State*. New York: Routledge.
- Kumar, Priya C., Marshini Chetty, Tamara L. Clegg, and Jessica Vitak. Forthcoming. Privacy and Security Considerations for Digital Technology Use in Elementary Schools. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'19)*. <https://doi.org/10.1145/3290605.3300537>
- Lupton, Deborah, and Ben Williamson. 2017. The Datafied Child: The Dataveillance of Children and Implications for Their Rights. *New Media & Society* 19(5): 780–794.
- Marsh, Julie A., John F. Pane, and Laura S. Hamilton. 2006. Making Sense of Data-Driven Decision Making in Education. *RAND Corporation*. https://www.rand.org/pubs/occasional_papers/OP170.html [accessed November 15, 2018].
- Marwick, Alice. 2012. The Public Domain: Surveillance in Everyday Life. *Surveillance & Society* 9(4): 378–393.
- McCahill, Mike, and Rachel Finn. 2010. The Social Impact of Surveillance in Three UK Schools: Angels, Devils and Teen Mums. *Surveillance & Society* 7 (3/4): 273–289.
- Nemorin, Serena. 2017. Post-Panoptic Pedagogies: The Changing Nature of School Surveillance in the Digital Age. *Surveillance & Society* 15(2): 239–253.
- Plantin, Jean-Christophe, Carl Lagoze, Paul N. Edwards, and Christian Sandvig. 2018. Infrastructure Studies Meet Platform Studies in the Age of Google and Facebook. *New Media & Society* 20 (1): 293–310.
- Saldaña, Johnny. 2013. *The Coding Manual for Qualitative Researchers*. Los Angeles, CA: Sage.
- Singer, Natasha. 2017. How Google Took Over the Classroom. *The New York Times*, May 13. <https://www.nytimes.com/2017/05/13/technology/google-education-chromebooks-schools.html> [accessed November 15, 2018].
- Sparman, Anna, and Anne-Li Lindgren. 2010. Visual Documentation as a Normalizing Practice: A New Discourse of Visibility in Preschool. *Surveillance & Society* 7 (3/4): 248–261.
- Stark, Luke, and Karen Levy. 2018. The Surveillant Consumer. *Media, Culture & Society* 40 (8): 1202–1220. <https://doi.org/10.1177/0163443718781985>.
- Steeves, Valerie. 2010. Online Surveillance in Canadian Schools. In *Schools Under Surveillance: Cultures of Control in Public Education*, edited by Torin Monahan and Rodolfo Torres, 87–103. New Brunswick, NJ: Rutgers University Press.
- Wong, Jason. 2019. Adapting to the Needs of Learners, Educators and Schools with Chromebooks. *Google*. January 24. https://blog.google/outreach-initiatives/education/chromebooks-for-all/#!#_ga=2.72731665.328476789.1548342187-848113045.1548342187 [accessed January 24, 2019].
- Zuboff, Shoshana. 2019. *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. New York: Public Affairs.