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Nemorin Selena

Post-panoptic pedagogies: the changing nature of school surveillance in the digital age

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Article | **Post-panoptic pedagogies:** The changing nature of school surveillance in the digital age

Selena Nemorin

Monash University, Australia.
selena.nemorin@monash.edu

Abstract

The aim of this paper is to explore critically the everyday conditions of surveillance in the contemporary secondary school context. Using a classical ethnographic approach, it seeks to unpack the range of surveillance practices and processes that are at work within schools as institutional settings, and how these are encountered and experienced by students, teachers, administrators, and other members of a school community. The main concern is with the hypothesized evolution of panoptic to post-panoptic surveillance and whether or not surveillance in schools emulates such developments, specifically with regards to the levelling of power hierarchies as a result of the incorporation of both vertical and horizontal modes of surveillance. To offer concrete examples of this shift in models of surveillance, this paper examine three manifestations of surveillance in schools: CCTV, mobile phones, and e-learning and content management platforms as modes of dataveillance, a particularized form of surveillance that has come to characterize modern surveillance functions. The primary question that drives this research is what evidence is there for these functions/modes of surveillance, and how are digital technologies implicit in their operation?

Introduction

Surveillance has become an integral part of everyday life, giving rise to talk of "electronic police states" and the "surveillance society" (Ball et al. 2013; Lyon 1994; Marx 1985). The technique typically refers to actions that enable public and/or private agents to manage and control populations (Gandy 1993). Traditionally, surveillance has involved vertical forms of monitoring where more powerful actors exercise control over the less powerful. Recent technological developments, however, have increased instances of horizontal surveillance where it is argued that power hierarchies are more or less flattened. Here, individuals and groups gather information on each other through various interpersonal electronic techniques that are implicit in the use of popular digital media—not least social networks such as Facebook (Marwick 2012; Tokunaga 2011). Also prevalent in recent times is a range of self-surveillance processes and practices, where individuals deliberately monitor and manage their own actions and behaviours.

While digital surveillance in school is not a global phenomenon (it has been challenged legally in Germany, for instance), surveillance processes and practices are now a pervasive feature of many K-12 schools in Anglo-Saxon countries. Common forms of surveillance include CCTV (closed-circuit television), online monitoring strategies, smart cards, RFID (radio-frequency identification) tags, and biometric tracking. Through such technologies, modes of discipline, measurement, and control of school populations have increased steadily—albeit attracting less controversy and resistance than has been the case with the implementation of surveillance technologies in society more generally.

Matters of surveillance tend to be largely justified (and often accepted) as underpinning schools' ability to function in the digital age. Often this technology is enmeshed with issues of school safety and protection. For instance, it is estimated that 40 per cent of English schools are using biometric technology to monitor the movements of students (Big Brother Watch 2014). In addition, the UK Department for Education has granted permission to schools to implement surveillance technologies to monitor student behaviour in classrooms, corridors, and playgrounds. Live online feeds of these images are available to teachers and parents (Edgar 2014).

Surveillance is also increasingly associated with enhancing the pedagogic efficiencies of schools and classrooms. In 2013, the Bill & Melinda Gates Foundation invested more than $1.4 million in the development of "engagement pedometers"—biometric bracelets that can monitor electrical changes in a student's nervous system as an indication of increased levels of interest and excitement during lessons. This and other modes of self-generation of data by individuals has led to talk of the "sentient school" where amassed forms of personalized surveillance data can be used to direct teaching and learning on a real-time responsive basis (Lupton 2014).

Notwithstanding such cutting-edge surveillance techniques, most schools in Australia remain preoccupied with more mundane forms of student monitoring, grounded primarily in the language of care and security. For instance, in the state of Victoria (the context for the empirical elements of this paper), principals have asked the State Government to install additional security cameras to protect school staff. According to the Australian Federation of Principals president, "the employer has got a responsibility of duty and care. They need to find the resources to ensure there's at least some semblance of security and safety" (Lauder 2013: para.10). In this sense, many of the most commonplace forms of surveillance, such as CCTV, are seen as essential—if not desirable—additions to the contemporary school setting.

Of course, there is much more to these technologies of surveillance than benign issues of safety, care, and sentience. As a handful of scholars have begun to demonstrate, school surveillance must be understood in problematic rather than pragmatic terms (Hope 2015; Taylor 2013). Indeed, as Monahan and Torres (2010) argue, surveillance in schools is increasingly used as a form of knowledge production. On this view, surveillance becomes a dominant organizational logic of the public school as an institution, shaping its day-to-day activities and "reifying normative categories of appearance and behaviour" (2010: 7).

The aim of this paper, then, is to explore the everyday conditions of digital surveillance in the secondary school context. In particular, it seeks to examine the range of surveillance processes that are at work within public schools as institutional settings, and how these are encountered and experienced by students, teachers, administrators, and other members of a school community. Working with Foucault's (1977) model of panoptic discipline and Deleuze and Guattari's (1988) rhizomatic structures in the control society, my main concern is with the hypothesized evolution of panoptic to post-panoptic surveillance and whether or not surveillance in schools emulates these developments. This paper does not seek to offer a comprehensive critique of rhizomatic surveillance in schools. Rather, it is a preliminary effort at identifying points of departure from panoptic modes of surveillance in digital schools—changes that may prove better fitted to rhizomatic structures. It is also an attempt to prompt discussion on alternative theoretical constructs that might be used to make sense of new surveillance technologies in digital schools.

To offer concrete examples of this shift in modes of surveillance I examine three manifestations of surveillance in digital schools: CCTV, mobile phones, and e-learning and content management platforms as modes of *dataveillance*, a particularized form of surveillance that has come to characterize modern surveillance functions. Dataveillance refers to the systematic monitoring of individuals and/or groups through personal data systems in order to regulate or govern behaviours (Clarke 1988). The primary question that drives this research is: What evidence is there for these functions/modes of surveillance, and how are digital technologies implicit in their operation?

Method

These questions and concerns are addressed through data generated from a three-year ethnographic study of three socially and geographically diverse secondary schools in Victoria (Table One). The studies revolved around technology (non)use within each school. At a system-wide level, Australian schooling is modelled on the UK system, with many similarities remaining between the two systems, particularly in terms of the implementation of recent neo-liberal reforms of marketization, choice, and competition. That said, the Australian school system is federalized in nature, with the country's six states and two territories taking responsibility for the development and enactment of curriculum and assessment frameworks. Moreover, like some European countries there is a large Catholic school system which accounts for about 20 per cent of student enrolments.

The case study schools were all government-funded, public schools catering for 11 to 18 year olds from a local catchment zone. They followed an adapted version of a national curriculum, and were subject to a number of federal and state accountability measures, such as the annual publication of key indicator data (e.g., examination results, student attendance rates, satisfaction measures). The schools were selected to ensure diversity in relation to what were identified as key factors such as population density and population characteristics (e.g., ethnic and cultural background, levels of educational achievement, socio-economic status). The focus of the present article is on the city suburb school—*Lakeside Secondary College*:

	School characteristics	Location
Mountview	1170 students, 97 teaching staff, 51 non-teaching staff 20% language other than English 36% progress to university Students encouraged to bring their own network compatible digital devices into school	Rural area in East Victoria, bi-located in two small towns (populations: 13700 and 4500) Median household income: $900/weekly 10.4% unemployed
Lakeside	1190 students, 102 teaching staff, 27 non-teaching staff 30% language other than English 65% progress to university Students required to bring approved network compatible laptop computers into school	Inner-city suburbs, Melbourne Median household income: $2200/weekly 3.7% unemployed
Middle borough	360 students, 31 teaching staff, 17 non-teaching staff 43% language other than English 66% progress to university Students required to bring network compatible iPads into school	Outer-city suburbs, Melbourne Median household income: $1285/weekly 5.7% unemployed

Table One. *Details of the three case study schools*

Using a classic school ethnography approach (Delamont 2014) to explore "everyday life surveillance", ethnographic techniques such as interviews, observations, extended field notes, and document and policy analyses were employed to gain a detailed, "thick" sense of how different actors negotiate competing discourses in regards to digital media and innovation (Merriam 2009). Deliberately selected groups of "high-using" and "low-using" students, teachers, administrators and leaders within each of the study schools were identified as suitable candidates for sustained study. Although there has been work on the many obstacles encountered when seeking and retaining access in educational contexts specific to Surveillance Studies

(Taylor 2014), our experiences were different. These differences could be because surveillance was not explicitly mentioned in our project proposal as it was not a theme that we considered when designing the project. Rather, it was a recurring theme that emerged during our fieldwork and as a key element in all three schools.

Our observational research took place along a continuum from non-participatory observations (e.g., sitting at the back of classroom and staff meetings) through to participation in some classes (either as assistant or student). Unstructured observations and field notes were made in and around the schools, and where appropriate photographs, videos, and sound recordings were taken to extend the scope of investigations beyond the spoken and written word. Alongside hundreds of hours of corridor conversations and brief exchanges with students and staff, formally planned, semi-structured interviews were conducted with school teachers, leaders, and ancillary staff. Given the recurrence of the theme of surveillance, we conducted follow-up interviews to obtain more detailed accounts of digital surveillance in school. Although dialogue was encouraged to develop organically, an interview schedule had been created to ensure specific areas were addressed in each interview. The interviews varied in duration from 30 minutes to 1.5 hours. Most staff and students were receptive to being interviewed about the subject matter, with the exception of the assistant principal who understood "surveillance" as a pejorative term.

Findings: panoptic to post-panoptic

The historical-political movement from a disciplinary society to a control society as Deleuze would conceive of it (in Hardt and Negri 2000) marks a shift from the more centralized power of institutions (e.g., prisons, schools) to rhizomatic structures of control. These structures extend beyond explicit disciplinary processes of power to more fluid and implicit forms embedded at various points in the practices of day-to-day life. In this mutable environment, two primary modes of surveillance have emerged from our data: (i) Fixed and tangible: power can be traced top/down as in the case of panoptic surveillance; (ii) Mobile and immaterial: power structures are more dispersed and involve heterogeneous actors akin to the rhizomatic, although these structures are not necessarily non-hierarchical. In order to contextualize developments in surveillance techniques from the panoptic to encompass the rhizomatic, the following sections seek to illustrate the dimensions of these networks of everyday surveillance in schools, and highlight where they intersect to include panoptic and rhizomatic elements of both discipline and control societies.

(i) Panoptic surveillance
Foucault (1977) examined surveillance as a mid-20th century method of discipline and control using philosopher Jeremy Bentham's prison architecture the *panopticon* as an analytical tool. The structure, a watchtower, was designed to be placed at the centre of a semi-circular arrangement of cell blocks. Invisible to prison inmates, the inspector in the watchtower had the capacity to see into any cell at any given time. Using the metaphor of the panopticon, Foucault explored the power relations that emerged through processes used to discipline individuals and groups. In this capacity, the panopticon was not simply a structure for observation lacking other disciplinary forms of power, it was also a mechanism that could be used to deploy a mode of soft power working to control and normalize individuals, shaping them into docile bodies—a form of "soul training". This attempt at behaviour modification occurs within a range of institutional contexts such as prisons, hospitals, factories, schools, and so forth. The metaphor of the panopticon captures underlying power relations in how diverse technologies and contexts of surveillance position and manage bodies and identities.

The more commonly studied form of surveillance in school is the CCTV system, and it is an artifact that illustrates panoptic surveillance (Hope 2013; Taylor 2013). Used as deterrents, these cameras were visible in all three schools, signalling to students, parents, staff, and visitors that they were being watched twenty-four hours a day, seven days a week. The footage was stored in a remote location and could be viewed by

individuals in administration and the technical support team when needed. In Lakeside Secondary College, both functional and fake surveillance cameras were installed in rooms, hallways, and in the school yard.

Such technologies in schools can be seen as working to normalize disciplining strategies, yet not all school community members considered CCTV cameras in a negative light. The assistant principal, for example, viewed the system as beneficial to students:

> We are able to know more about our client, the student, and the information being in one place means it's easily accessible, and so for the benefit of the student … It's not monitoring, it's actually getting to know the student. And so if you know the student you can help the student and that's the reason. If we've got absences in there against student A and you note those absences, it's not because you want to hang the kid, it's you want to know, well, why is this kid absent, how can we help the kid?

According to Taylor (2013), a primary reason for installing CCTV in schools is generally for the purpose of crime prevention and detection. Echoing the popular rhetoric of safety and care, the assistant principal also noted:

> The main reason is for safety and security. They [CCTV] aren't in classes, so classes and teachers are not observed. They are mainly around locker areas or external areas so that we can assist police, if we have to, in case of burglary or graffiti or damage. They are in the locker areas to see—there might be a case of theft. So it's basically a safety and security medium.

Yet contrary to what he was claiming, our research evidenced that CCTV cameras were indeed placed in classrooms. It was also evident that certain teachers and students were unaware of cameras in the classroom. One teacher who had been teaching at the school for over a decade was surprised to discover there were cameras installed in classrooms. While he did not seem to mind the presence of these cameras, he expressed concern about the purpose of surveillance in school:

> If I were a younger teacher just starting out I could imagine not being comfortable with a camera pointed at me in the classroom. But after more than 20 years of experience as a teacher, I'm confident in my abilities and I wouldn't really care about the cameras. That said, why do we need cameras on us anyway? How does it change the way we teach? What does it do to the students? If it's affecting teachers then it would be affecting students too—it goes both ways. Cameras in the classroom might minimize misbehaviour … who knows? … It's not as if we're surgeons being filmed while we're operating on patients—where our work determines if someone lives or dies. Why is it necessary to have constant monitoring everywhere?

And as a female student noted: "I don't think they're in the classroom. There might be voice monitors or something … My maths teacher said it … but he was just probably making it up so that we didn't do anything." Although cameras were obviously not in all classrooms, the threat of implementation of surveillance equipment was used to discipline and control students.

While some students viewed the cameras as objects that encroached on their personal privacy where the school "can monitor everything we do on it", others held a different view. For instance, one male student sought more surveillance to "properly monitor" what people were actually doing as "many people do the wrong thing", thereby repeating the security and care mantra found in society more generally in terms of the benefits of surveillance:

[CCTV cameras are necessary] if something happened ... not in the classroom. I think that's a bit weird, but outside—like if a fight happened or something and the teachers needed to see who did it or on the weekend like some burglar or something.

When pressed for opinions on cameras in the classroom, a group of Year 8 students were varied in their responses, articulating that the role of disciplinarian belonged to the teacher and not to a machine:

Mel: There's already a teacher in the room. I think that's enough.

Gillian: I don't think they're necessary [in the classroom].

Arin: Sometimes the camera should be in there because if the teacher goes away for a minute to get something from their desk and something happens in the classroom, then they should have cameras, but when the teacher's in there it's pointless having cameras.

Despite the fact that students were aware of the cameras installed around the school grounds to monitor their movements and actions, they expressed ambivalence about monitoring their behaviour in general. As the excerpt below indicates, what did trouble the students—articulated by both sexes—was the impact of surveillance on gaming:

Gillian: It's good for students not to have that many cameras because we get to play games on the computer. But it would be better for teachers to have more cameras to monitor what we're doing because it's bad for them if we're not doing the work that they've told us to do.

Although the technical support "boys" were hired by the school to not only perform support services for the school community but to monitor inappropriate information technology practices, they not only lacked the time to surveil students, but they exhibited a lack of concern with tracing students' online behaviours. In fact, the tech support team championed the students' creative capacity to bypass school-based constraints such as filtering:

We [are] able to check what websites are being accessed and by whom, but we don't, because we've got as you can see, we have so many things happening. We can't check it all the time ... if an email gets sent through by a student with a message, something like that, we'll be able to check that. If they're trying to access something through the internet we'll be able to see that. We used to [monitor], but we stopped doing that ... especially with Bring Your Own Device (BYOD) and stuff like that we don't, it's not ethical.

In this light, our research showed that the effects of surveillance on the school community were emerging as non-homogenous (Yar 2003).

The idea of a watchtower in school was also evidenced by the quote below, where the teacher, as a result of an e-learning application installed on his laptop and, at times, from the comfort of his own home, could monitor students without their knowledge:

I can monitor what students are doing in real-time. You know how part of classroom management means walking around the class to keep students on task? Well I don't really have to walk around with this application to be able to know what they're doing. I can see what students are doing as they're doing it. If they're not on task, I'll know and I'll call them on it.

Foucault's panoptic watchtower was a physical and fixed structure in which the inspector was thought to reside and monitor prison inmates; in the digital school, however, the teacher's computer had become a mobile watchtower through which he could monitor his students from anywhere and at any time. Although the computer here was certainly an example of the panoptic, its portability and reach resonated with the fundamentals of liquid surveillance where "the architecture of electronic technologies through which power is asserted in today's mutable and mobile organizations makes the architecture of walls and windows largely redundant" (Bauman and Lyon 2013: 4).

As an extension on the characteristics of panoptic modes, surveillance in schools seemed to be moving from fixity to mobility. So while panoptic models are certainly useful for mapping the ontologies of surveillance in school, the increasing digitization of such environments has changed the form and practice of surveillance in terms of muddying boundaries of time and space, physical and immaterial, public and private. A complementary framework for understanding these emergent structures is the *rhizome*—a metaphor put forth by Haggerty and Ericson (2000) to theorize surveillance in society more generally.

(ii) Rhizomatic structures

As mentioned previously, scholars have claimed that in a network society surveillance has become post-panoptic. Lianos (2003), for instance, maintains that Foucault's model of control and its explanatory power is a framework for study that does not engage adequately with the post-industrial subject emerging in late modernity. Bauman and Lyon (2013) also call for an element of change, claiming that "the architecture of electronic technologies through which power is asserted in today's mutable and mobile organizations makes the architecture of walls and windows largely redundant" (2013: 4). Individuals and groups now flow across borders, airports and stations … information flows through diverse communication systems. Modes of communicating and monitoring have become mobile.

For Boyne (2000), post-panopticism is a concept that takes into consideration the ongoing pressures of general surveillance while also acknowledging that significant changes have occurred. Boyne summarizes several primary arguments adopted by theorists who argue against the panopticon as a suitable framework for analyzing contemporary society: *Displacement* of the panoptic ideal by mechanisms of seduction; *redundancy* of the panoptic impulse brought about by the persistence of self-surveillance functions; *reduction* in the number of occasions of the need for panoptic surveillance on account of simulation, prediction, and action before the fact; *supplementation* of the panopticon by the synopticon (surveillance of each other); *failure* of panoptic control to produce docile subjects (also in Ajana 2007). Arguing that Foucault's conceptualization of surveillance fails to engage directly with contemporary developments in surveillance practices, Haggerty and Ericson (2000) draw on the theoretical framework of Deleuze and Guattari, using the concept of *rhizome* to explain two primary characteristics of the surveillant assemblage: "Its phenomenal growth through expanding uses, and its levelling effect on hierarchies" (2000: 614).

A feature of rhizomatic structures of surveillance in school comprised online monitoring techniques pinned to strategies of data collection. The increasing use of the digital in teaching activities included the implementation of e-learning and content management platforms. For instance, all three schools used *Compass*, a software program that allowed staff and parents to monitor students to varying degrees in real-time. Students also had the capacity to self-monitor on the system. Through this platform student information, learning tasks, reports, medical notes, attendance, timetables, and so on could be shared. Behind the scenes, enormous amounts of student data were calculated and crunched. The use of this program was mandatory and central to the daily functioning of the school. In fact, it was seen by staff as a boon for school management. One ancillary staff member celebrated the benefits of *Compass* as a tool that not only made student management more efficient but worked as a deterrent for misbehaviour, specifically truancy: "[Students] realize they can't get away with it. I'll say, 'Look, you can't cheat the system' because, with *Compass*, they're logged every class. Their attendance gets put in every class. I think you get kids, I guess, scared of getting in trouble so you go to class."

While the principal also acknowledged *Compass'* usefulness as a behavioural management resource, he elaborated on how it offered him communicative capacities and "efficiencies":

> It will visualize my schedule; it will visualize automatically any room changes I have; it will flag any meetings that I might have. When I go to mark my role, if a kid's got trumpet practice, it'll actually have "trumpet practice", and I can go to you, "hey, shouldn't you be in trumpet practice? Oh yeah, see ya!" It'll give me all the medical alerts for students; it'll give me connections to student home profiles; it'll give me resources for my teaching. I can use a module called *Learning Tasks*, so I can do all my lesson preparation, I can archive all my documents in this program, and then the students can access it—effectively it replaces my chronicle as well because I can keep a lot of my marks there; when students submit work electronically it will produce a list of the kids' names with green, red or yellow dots which will just tell me which kids have electronically submitted the work. It lets me automatically email parents; it will let me email groups, so I can email all the teachers. It's a really nice mixture of communication and record keeping. It gives me a whole lot of efficiencies.

Also part of the rhizomatic surveillance assemblage in school were various non-compulsory applications used in-class as pedagogical resources. The Head of Innovation at the school, for example, lauded the effectiveness of the *Microsoft Office Mix* program. This program was a free add-in to *PowerPoint* that allowed users to create online interactive lessons and presentations. In keeping with the analytical power of *Compass*, a wealth of student data could be mined by Microsoft. The teacher explained that with a few clicks he was able to generate a report on student analytics that included levels of participation, time spent on tasks, quiz results, and so forth:

> One of the markers that prompted me to re-examine how I was teaching was seeing how long students took to get through particular tasks. When I saw that many of them were taking over an hour to do something I thought would only take about fifteen minutes, it opened my eyes. The information was enough for me to really slow down the pace of the class and rethink how I was teaching as well as the content I was covering.

Although the teacher could track his students through the application, his own activities were also identified and recorded on the system, a facet of the application that did not bother him. While it can be argued that teachers have been both the watcher and the watched for many years which certainly fits with the panoptic model (e.g., teachers have always been monitored by leadership, and auditing and assessment systems), this mode of surveillance also resonated with a rhizomatic network inasmuch as increased connectivity from schools to numerous external agents allowed immediate involvement of a range of heterogeneous actors, and continuous tracking occurred in real-time from diverse remote locations. The top-down institutional hierarchies of observation evident in the panoptic model of surveillance remained, but in keeping with rhizomatic structures watchtowers also emerged at various points in the network as a result of the increased connectivity of schools.

Another free to use application was *Nearpod*, an online resource allowing teachers to create their own interactive multimedia presentations for the classroom or choose from a library of ready-made plans. Students could use the application on their devices to access content and submit responses to open-ended questions, quizzes, polls, drawing activities, and so forth. From their own computer, teachers could interact virtually with students as they worked through presentations in real-time. As one Lakeside teacher put it, *Nearpod* resulted in "100% engagement". While *Nearpod* was promoted as able to "harness" students' attention through its content, the underlying power of the application was grounded in a logic of control that promised to keep students "focused … minimizing off-task behaviour". In sum, *Nearpod* offered educators

the opportunity to bring classrooms to "life" (Nearpod 2015) while disciplining students through controlling their digital devices.

One substitute teacher captured the emergence of rhizomatic surveillance in schools well: "With all these new programs, students can't escape you anymore." The inability to escape the gaze of the school was evident in the fact that monitoring could now reach beyond the school as a physical enclosure. For instance, the principal explained that a ministerial directive mandated schools to respond to online harassment that occurred at any time of the day or night, any day of the week:

> The justification was that these behaviours impact on relationships and those relationships occur partially during the school week, and therefore we think you should take a step out of that. That's radically different … if 15 years ago a couple of girls called each other bitches in the shopping centre on a Saturday afternoon, it happened. Even if they were a bit antsy with each other on the Monday, we wouldn't be talking to them about what they did on Saturday afternoon. But now, if one of the kids comes in with some screenshots where the other one called them a bitch on Facebook, suddenly we're taking action.

The process of *synopticism* also emerged, where students and parents were now surveilling each other. The principal spoke about how the school was being informed of student activities outside school grounds:

> It usually comes from student self-report, or student report to others. Some, of course Facebook being what it is, you know, these friends of friends, of friends, of friends, so you know, there's enough staff that have got children at this school, or friends of children at this school, so it inevitably leaks out, and if it's nasty enough it gets reported to us directly. We've had situations where parents have come in the front office with their iPad, and they've just opened their iPad and said, "look, have a look at this"; or they have screenshots on their phone, or sometimes even hard copies they bring in.

Monitoring was not restricted to administration, teachers, and parents watching students or students watching each other. An element of *sousveillance* [where students were watching teachers, administration, and the school more generally] was at play. The principal noted: "The online environment has also given students an opportunity to criticize teachers, and criticize schools. So we've periodically had Facebook pages with memes … and some of them are really funny mind you, some of them are really hilarious, and some of them are just outright vile. Just vile."

While students were indeed participating in acts of sousveillance, they were not particularly interested in it as a way of monitoring teachers or pushing back against codes and norms. As one student put it:

> There's an app called Snapchat and you can film stuff and send it out, and yeah, people just film their teachers explaining something. But it's not that interesting. When students do funny presentations their friends will video them as a joke, but we generally, they generally get caught … Most teachers just take it [the device] away or they say "put it away and don't use it again."

Yet this extension of surveillance did not necessarily mean a levelling out of power dynamics (Hier 2003). Power seemed to retain a top-down flow while, at the same time, connecting a diverse range of actors (both watchers and watched) into the surveillance process. Another noticeable change was evident in the new modes of student/teacher dataveillance that moved from fixed and tangible to more mobile and invisible forms.

Discussion

Dataveillance in the intersection of panoptic and rhizomatic structures
A shift in surveillance occurred in the 1980s (Clarke 1988). Reliance on augmented computational capabilities and the growth of digital information management systems gave rise to technical and systematic developments in what might be considered more traditional (bureaucratic) modes of surveillance. Surveillance grew to comprise collection, collation, and analysis of "data trails" associated with individual identities. This manifestation of surveillance grounded in the identification, collection, and analysis of digital information in order to influence, manage, entitle, or control subjects and groups whose information is collected (Bennett et al. 2014) has been understood as dataveillance (Clarke 1988), a digital iteration of what was predominantly analogic surveillance. Dataveillance refers to the systematic monitoring of individuals and/or groups through personal data networks in order to regulate or govern behaviours. This dimension to surveillance can be used to illustrate the surveillance functions that have emerged in the digital school and have contributed to the move from a panoptic model toward a more complex form of institutional discipline and control that can be understood as rhizomatic in nature and form. The four classes of action that comprise dataveillance are as follows: 1) *recorded observation*; 2) *identification and tracking*; 3) *analytical intervention*; and 4) *behavioural manipulation* (Esposti 2014).

Closed-circuit television
The most prevalent surveillance technique found in Lakeside can be seen as reflecting what might now be considered a mundane form of monitoring—CCTV. The functions of CCTV fit neatly with the idea of *recorded observation* which refers to the act of paying close attention to an individual or group in order to gather and store the information in electronic format. This mode of monitoring can occur through watching/filming, listening, or sensing. CCTV systems are typical examples of technologies conceived to conduct recorded observation. As Esposti (2014) notes, recorded observation performs a key function in modern digital economies as it contributes to increased volumes of data about the individual/s being observed. In this capacity, our findings in regards to CCTV usage can be explained simply as basic panoptic surveillance modes that have become ubiquitous in society coming to bear on schools.

The presence of CCTV and justifications for having these cameras at Lakeside resonate with Casella's (2006) observations that security companies, at a certain level, convince consumers that they are contributing to the betterment of society. In this sense, Lakeside school administration and teachers were under the impression that surveillance equipment was an invaluable part of creating a successful school, illustrating Casella's (2010) point that "using security equipment and having it used on you is a sign of being forward-thinking and modern . . . technology (including security technology) is a sign of advancement" (2010: 79–80).

Others have argued that in the case of CCTV and schools, the state devolves power downward to new agencies of control borne from the market (Hope 2015). Whereas in the past the state may have held the reins on maintaining the safety of the school community, the security industry now emerged as an increasingly prominent player. Although strict school controls that trickled down from the Department of Education and Training were still enacted within the local school context, this form of discipline and control was now achieved at Lakeside with the aid of both private security companies who were installing and servicing a range of new surveillance devices such as CCTV, as well as corporate bodies who had a stake in education via their role as in-house technical support, for example.

Yet although the general belief existed that CCTV systems acted as deterrents to individuals and groups who might otherwise vandalize the school grounds or behave in an undesirable and/or violent manner, CCTV in Lakeside had become largely a symbolic artifact that checked the boxes in terms of keeping the school a safer space while, at the same time, lacking the force to significantly manage behaviours. Despite

the fact that with CCTV "anything" could potentially be seen, this tool for surveillance did not present as a technique that was a major cause of concern for the school community. CCTV as a mode of monitoring was indeed normalized, but most students and teachers did not change their behaviours when in range of this form of recorded observation, emphasizing the failure of the panoptic to produce docile subjects. In contradiction to some of the more alarmist literature on CCTV in schools, it can be argued that at Lakeside, CCTV as surveillance was "no big deal"—expressed by both student and teacher ambivalence to this mode of panoptic monitoring.

Mobile phones

Another dimension to surveillance that emerged in terms of recorded observation was the use of mobile phones—illustrating both aspects of synopticism and sousveillance. Such uses of mobile phones certainly disrupted the power structures of panoptic models of recording and are worth mentioning briefly. Traditionally, the panoptic framework constituted vertical forms of monitoring where more powerful actors exercised control over the less powerful. Recent technological developments, however, have resulted in the emergence and increase of horizontal forms of rhizomatic surveillance where power hierarchies, as Haggerty and Ericson (2000) would argue, are more or less levelled out. In this context, individuals and groups gather information on each other through various interpersonal electronic strategies that are implicit in the use of popular digital media (e.g. Facebook, Snapchat).

As in the case of Lakeside, there now existed a normalized mode of self-surveillance processes and practices, where individuals willingly monitored and managed their own actions and behaviours through myriad digital technologies. Also evidenced was a tendency to monitor each other. Parents were monitoring students and reporting "inappropriate" behaviour to administration. Students were monitoring each other and teachers. Yet, while these students were using their mobile phones to watch each other and social media to criticize their school, their motives had less to do with resistance to top-down power and more to do with what they saw as fun and games, unlike parents whose motives for action were to discipline and control student behaviours through the intervention of the school as an authoritative power. In this context, subjects were shaped by the internalization of power enacted through a division of surveillance between state, commercial bodies, and citizens. As a move away from traditional characteristics of the panoptic model where watching occurred in a top-down manner, surveillance practices were now being increasingly supported and encouraged by the subjects who were the targets of data collection systems (see Hier 2003). The hierarchy of surveillance might have appeared to be levelling out, but the point at which power resided at the top was not replicated as a force of power and resistance from below.

While it is reasonable to argue that the digital dimensions of new modes of surveillance were indeed extending the reach of discipline and control well beyond the constraints of physical observation and monitoring, it is also fair to claim that bodies and identities were no longer the only focus of surveillance. What emerged from the data as a pressing cause of concern and an undertheorized area of study was not the mundane form of panoptic surveillance that one finds in CCTV, for example. Rather, it was the more immaterial form of surveillance that we ought to turn our attention to in order to understand surveillance in the digital school as both panoptic and rhizomatic. The power of e-learning and content management platforms as tools for liquid surveillance—through dataveillance—is becoming increasingly foundational to the school as an institution of discipline and control and merits attention.

E-learning and content management platforms

According to the former editor in Chief of *Wired* magazine, Chris Anderson (2008), we have become "the most measured age in history" with an influx of data produced mostly from the technologies we develop. In his opinion, we live in an era where information has shed its "body" as a result of the shift from physical storage devices to "the cloud". This tendency toward measurement and its movement to the immaterial is mirrored in the digital school where, as Lingard et al. (2015) observe, measurement and control of school populations have increased steadily (e.g., performance data; satisfaction data; data/profiling/filtering). In

such a digital environment, educators engage in *post hoc* analysis of students' personal data trails that are based on continuous collection and collation of data in schools (Marx 1985). It is here where the remaining classes of dataveillance action emerge clearly.

Identification refers to recognition of an individual's identity through the analysis of an object or that individual's features. *Tracking* refers to tracing the subject who has been identified.[1] *Analytical intervention* refers to the use of *analytics* as a method of organizing the information collected into useable knowledge—this typically results from identification and tracking. Analytics is a process of searching for patterns through the analysis of "raw" data. The output from this method is the production of certain kinds of knowledge that can be used to guide a course of action (Esposti 2014). This form of knowledge is called "actionable" knowledge (Gandy 2012). Thus, analytics is "the process of developing actionable insights through problem definition and the application of statistical models and analysis against existing and/or simulated future data" (Cooper 2012: 3).

Mirroring society at large, the algorithms foundational to e-learning and content management platforms such as *Compass*, *MS Office Mix*, and *Nearpod* work with data that is continuously mined and analyzed, sometimes without users' knowledge and/or with their indifference as in the case of the teacher who was using these applications to manage his classroom. Relatedly, the school community might not recognize the array of techniques that turn student/teacher inputs into data that categorize, compartmentalize, and quantify subjects, or they might not have a choice in the matter. For instance, *Compass* was mandatory school-wide and students whose teachers used *MS Office Mix* and/or *Nearpod* as pedagogical resources did not have a say in whether or not they could opt-out. As such, the form of power attached to this flow of data can be understood as "pan-analytic", where, as Koopman (2015) maintains:

> We may *still* be docile disciplinary subjects who conceive of ourselves as constantly under the gaze of parents, teachers, and society at large, but we have *also* become subjects of our data … 'informational persons' who conceive of ourselves in terms of the status updates, check-ins, and other informational accoutrements we constantly assemble … Our phones and computers are constantly communicating even when we are not—and even where we are made aware of it we are coaxed into not questioning it because we are told that it has become obligatory to be online and to have an online presence. (para 10)

When knowledge produced through analytical intervention is used to inform procedures and practices, the fourth category of dataveillance comes into play: *behavioural manipulation*. This category refers to the ability to influence individual or group actions intentionally and was evidenced in Lakeside where staff used analytics derived from e-learning and content management platforms to [re]orientate student actions. This form of behavioural management came across clearly in the case of *Compass*, where administration, teachers, and ancillary staff acknowledged the system as an efficient tool for discipline and control of students. Management of students was also evident in the function of both *MS Office Mix* and *Nearpod*. For instance, given the capacity to watch students, teachers could determine if students were "not on task" and take specific courses of action to ensure these students were working according to performance expectations, thereby "minimizing off task behaviours" with the aid of educational technology programs.

Where the surveillance mechanism of the panopticon was contingent on total visibility—i.e. prison inmates could see the tower and thus assume the guards inside were watching them, the mechanics that collected

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[1] Biometric technologies (e.g., pupil recognition, fingerprinting) are examples of surveillance technologies that can identify people. RFID tags are examples of technologies that can both identify and track objects. ID cards are examples of techniques to identify individuals. Unique identifiers (numeric codes) can track objects and people by making distinctions between records in a database.

and crunched student analytics could be seen to presuppose the opposite, functioning immaterially with a reach that cut across space and time. Koopman (2015) writes:

> The watchtower garishly announced itself; we need to see the security cameras for them to be effective. By contrast, the algorithm is invisible as it constructs its composites; it ever runs silently in the background like all that circuitry, voltage, and machine code that quietly lets you into your computer without ever announcing itself. (para 6)

This blurring of material and social boundaries of schools and schooling was in keeping with the characteristics of liquid surveillance as mobile and unfixed, but also encapsulated the idea of the rhizome inasmuch as the analytics potential of these platforms also extended beyond the school as a physical space— the teacher could watch the student from anywhere and at any time without the student knowing. The difference from the panopticon, however, is that the teacher was also being watched and his movements captured by the invisible computations powering his free to use applications. As the *MS Office Mix* (2015) privacy agreement stated: "we may use website analytics tools to collect standard information that your browser sends to every website you visit, such as your IP address, browser type and language, access times, and similar information." In this capacity, the watcher in the watchtower was being monitored by an entity that was not only always-on but also existed in the immaterial—way beyond the reach of the subject's gaze and the school as a fixed physical enclosure.

Conclusions

This paper has served as a preliminary attempt to trace the trajectory of panoptic to rhizomatic surveillance structures in digital schools—from CCTV to immaterial forms of surveillance such as interactive e-learning and content management platforms that have embedded monitoring practices, linking analytics to performance indicators and pedagogical actions. These latter hybrid modes of [panoptic/rhizomatic] surveillance have gained momentum, spreading rapidly across and beyond the enclosures of the school landscape and, at times, working invisibly to amass vast amounts of student and teacher data for various purposes. In light of this momentum, educators and educationalists must turn their attention to how these modes of surveillance are being deployed in the digital school and how these reams of data are being used and dispersed by the companies engaged in dataveillance of school communities.

Surveillance techniques were certainly significant in the enactment of relations between both school community members and agents beyond the schools. Even when staff appeared to be seeking pedagogical efficiency by making use of data to inform their in-class actions, their work was replicating forms of dataveillance inasmuch as students became reduced to data points whose information was accessible to corporations and, potentially, other third parties that may or may not have students' best interests in mind. The digital school facilitated the act of surveillance in the intersection of panoptic and rhizomatic structures: an institutional network that extended its reach from the physical to the virtual, from fixed to mobile structures, and from public to private, while bringing more actors into the process of surveillance.

From what has been observed in the present study, it is certainly unhelpful to suggest that schools simply reject the notion of school surveillance outright. Yet while accepting that the techniques of surveillance described cannot be refused point blank, it is worth thinking about how better arrangements might be reached. How, then, can surveillance strategies be used to *counter* rather than compound dominant modes of dataveillance? What would educationally beneficial surveillance in school look like? Where does the student/teacher data obtained from e-learning and content management platforms go? Who benefits from this data? What are the privacy concerns attached to these applications entering the school community? These are some of the questions that educators and educationalists must take into account as surveillance continues to instantiate itself as a normalized part of everyday school life. And in order to do the necessary work to attain a comprehensive understanding of the nuances of surveillance in school as a reflection of and

connected to larger society, educational research ought to be paying more attention to Surveillance Studies, and, conversely, Surveillance Studies ought to be paying more attention to educational research.

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