The Techification of Education in Ontario's Virtual Schools

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Abstract: In Ontario, Canada, the COVID-19 pandemic prompted the creation of publicly funded virtual schools for K-12, synchronous remote learning. Going into the 3rd year of operations, many of these schools are transitioning into permanent learning options. Using a critical theoretical lens, this paper presents my preliminary findings from my doctoral research examining principals' leadership practices in these virtual schools. The qualitative interviews conducted in Spring 2022 reveal an emerging trend towards the techification of education, a phenomenon where Big Tech becomes enmeshed in all parts of education. The results of my study show that virtual schools increasingly rely on Google/Alphabet products in ways that may place schools as training grounds for lifetime consumer loyalty and exacerbate existing inequities. I investigate this problem from the school principals' perspectives, as they are the mediators between policy and practice. Finally, I offer suggestions for how to mediate the techification of education at both the principal and policy levels.

Keywords: Leadership; Education; Virtual School; Ontario; Technology

Introduction

In Ontario, Canada, the COVID-19 pandemic prompted the development of virtual schools to accommodate socially distanced education. These virtual schools provide publicly funded, synchronous education to K-12 students through a remote, online platform (Ontario, 2020c). As Ontario moves into the post-COVID-19 world, some school boards choose to make virtual schools a permanent option for students. The findings in this study reveal an emerging trend toward the techification of education within these virtual schools. Techification refers to a phenomenon where Big Tech companies monopolize all parts of the social world, including computing, retail, media, and politics (Hendrikse et al., 2022). Using a critical theoretical lens, I show how techification reaches Ontario education through principals' efforts to mediate work intensification and support student engagement. Further, I show how this techification may lead to problematic consequences such as increasing Big Tech's profitability, commodifying student data, and exacerbating educational inequity.

Techification

Techification refers to the phenomenon whereby giant technology companies, commonly referred to as Big Tech, monopolize multiple industries (Hendrikse et al., 2022). Big Tech generally includes Google/Alphabet, Apple, Amazon, Facebook/Meta and Microsoft (Fernandez et al., 2020; Hendrikse et al., 2022). Big Tech gaining control of all social industries has been the subject of much research and popular media (e.g., Wakabayashi et al., 2021; Zuboff, 2019), and leading scholars in the area, Hendrikse et al. (2022) warn of what they call "The Big Techification of Everything. " The Big Techification of everything is "a scenario whereby Big Tech not only comes to rewire economy and society but also enmeshes itself evermore with the state, effectively become the sun in the new socio-technical solar system" (p.60). Concerns regarding the "Big Techification of Everything" stem from Big Tech's colossal market capitalization and monopolization of information communication technology resources. Such widespread influence prompts concern that techification may lead to a global corporatocracy.

Corporatocracy refers to a system of governance in which major corporations such as Big Tech joins with banks and governments to concentrate power amongst a small global elite (Perkins, 2004). Big Tech dominates the banking world through its market capitalization. Market capitalization is the price of the company's stock multiplied by the number of outstanding shares (Fernandez et al., 2020). As of 2021, Big Tech firms represent approximately 25% of the world's market capitalization (Birch et al., 2021). The COVID-19 pandemic accelerated Big Tech's merger into global politics, with the US and UK governments inviting Big Tech representatives to discuss solutions for the COVID-19 crisis (Hendrikse et al., 2022; Volpicelli, 2020). Big Tech's potential to develop into a corporatocracy is evident through these reaches into economic and political influence. As Big Tech gains power in all parts of the social fabric, each social institution becomes reorganized to prioritize corporate profits rather than the social good that was once intended. Such is one of the two concerns of the techification of education put forward in the current study.

Techification of education: The techification of education is signaled by Big Tech monopolizing educational technology, delivery, programming, and assessment. Research into the influence of Big Tech within education is growing (e.g., Norris, 2022; Ozalp et al., 2022;); however, as of this writing, this is the first study to use the label the techification of education. Techification is heralded by "digital colonization" (Ozalp et al., 2022, p.84), a process where Big Tech commodifies and controls educational data in order to become the sole provider of data-driven products that educational providers rely upon; by "pandemic profiteering" (Norris, 2022, p.35), where Big Tech companies saw phenomenal profits amidst the COVID-19 pandemic, in part by exploiting the vast demand for technology required for virtual schooling. At the same time, educational institutions faced monumental economic losses and by "platformization" (Kerssens & Dijck, 2021, p.250). Platformization is the phenomenon where Big Tech platforms integrate into the social fabric to such an extent that social institutions are turned into monetized assets as a result of data extraction (Kerssens & Dijck, 2021).

In Ontario, these harbingers of the techification of education can be seen through the Ministry of Education's partnerships with Big Tech to provide technology to students and families during the COVID-19 pandemic (Ontario, 2020a; 2020b). In Ontario virtual schools, Google is a commonly used learning platform, and Apple iPads and Google Chromebooks are the devices provided to students needing access technology (Smith, 2021). These partnerships added to Big Tech's pandemic profiteering through increased purchases of Big Tech products. These partnerships added to Big Tech's digital colonization by increasing the amount of student data exposed to Big Tech. Finally, these partnerships added to Big platformization by increasing the reliance on Big Tech platforms. This widespread use of Big Tech in education presents unique questions of consent, as in many cases, students and families do not have the choice of whether to opt into Big Tech or not (Norris, 2021). This potential transformation of education to a corporatocratic tool where students become reliant on Big Tech for basic communication, production, and learning is one risk of the techification of education (Klein, 2020).

Virtual Schooling

Virtual schooling is a form of educational instruction that uses an online delivery model where students participate in schooling remotely instead of in a traditional brick-and-mortar school (Clark, 2000; Russell, 2004). The use of virtual schooling has been steadily increasing since its inception (Bork, 1995; Davis et al., 2007; Gurr, 2004; Kingsbury, 2021; Palvia et al., 2018), but its use became widespread during the COVID-19 worldwide emergency switch to virtual schooling.

Virtual schooling has advantages and disadvantages for both the system and the students. Virtual schooling can increase administrative efficiency through artificial intelligence learning and advanced information computer technology systems and can decrease financial constraints through reduced infrastructure costs (Barbour & Reeves, 2009; Hart et al., 2019; Palvia et al., 2018). Conversely, virtual schooling requires heightened attention to digital privacy issues embedded into the information communications technology (ICT) and increased training for all staff on virtual technology, pedagogy, and leadership (Davis et al., 2007; del Río, 2021). Further, supervision of staff and students may be more difficult in a remote environment (Richardson et al., 2015). Students may develop additional digital competency skills and receive more immediate and sophisticated feedback from AI learning and intelligent assessment programs (Hart et al., 2019). However, these same systems may increase the prevalence of academic streaming (Davis et al., 2007), and the independent nature of virtual schooling may cause students to experience isolation and/or develop maladaptive social skills (Palvia et al., 2018).

Principals in virtual schooling: Principals are uniquely situated to report on how system-level policies, such as mandates – or lack thereof – for virtual learning platforms operate at the school level, as one of the primary responsibilities of school principals is policy implementation (Ryan, 2005; Starratt, 2004). Similarly, principals are well suited to report on teachers' practices when implementing policies on student supervision software, for example, as principals' other primary responsibility is instructional leadership (Leithwood et al., 2004; Ryan, 2005).

Research into principals' leadership in virtual schools indicates that while fundamental leadership skills relating to instructional leadership and fostering a positive environment remain consistent, other skills may need to be amplified or developed (Gurr, 2006; LaFrance & Beck, 2014; Pollock, 2020). Principals must change their communication habits to connect with stakeholders over multiple platforms (Gurr, 2004; LaFrance & Beck, 2014; Pollock, 2020). For example, an important part of principal leadership is creating a shared vision amongst staff (Cherkowski, 2016; Leithwood, 1994). That task must be approached differently in virtual schools, where staff are less likely to engage in informal interactions due to their geographic dispersion (LaFrance & Beck, 2014; Pollock, 2020; Richardson et al., 2015). Geographical dispersion increases staff and student autonomy, thereby making it necessary for principals to find more effective ways to maintain communication and supervision (Gurr, 2004). In this study, I show how principals' efforts in supporting teachers' accessibility and supervising students' engagement cause a growing reliance on Big Tech software.

Critical Theoretical Framework

Critical theory is an emancipatory theoretical framework focused on rebalancing unequal power dynamics that privilege dominant populations while marginalizing non-dominant populations (Niesche & Gowlett, 2015; Wilkinson, 2008). By studying educational leadership through critical theory, I assume that leadership changes may change social systems for the better (Ryan & Rottman, 2007). Further, such institutional change is supported by examining how power is differentiated, particularly through the influence of leadership systems. Through analyzing how systems of power operate in education and how they are upheld or opposed through leadership, I plan to support efforts to dismantle these systems in favor of more anti-oppressive actions. In this study, I have analyzed how techification supports access to technology and exacerbates systems of marginalization.

Ontario Context

The Ontario public school system has 2.025 million K-12 students (Ontario, 2022), divided into four systems: The French Public, French Catholic, English Public, and English Catholic (Ontario, 2022). The Ministry of Education sets curriculum requirements, develops provincial policies, and allocates funding to school boards (Ontario College of Teachers [OCT], n.d.). District school boards then distribute funding, build and equip schools, and develop board-level policies and programs (OCT, n.d.). School principals are hired by the school board and become responsible for the general management of the school. They have specific responsibilities to provide sound instructional leadership, implement Ministry and Board-level policies, and foster a safe and positive school environment (Leithwood, 2013; Ontario MOE, 2013; Pollock, 2020; Tuters & Portelli, 2017).

In response to the COVID-19 pandemic and the requirement for socially-distanced education, every school board created at least one virtual school option in September 2020. There is no readily available data to show how many schools were created and how many schools currently exist. However, data taken from the Ontario public school contact information dataset (Ontario, 2022b) shows 116 schools with either 'virtual,' 'remote,' or 'online' in the name listed as of September 16th, 2022[2]. Ontario's virtual schools are mandated by PPM164 (Ontario, 2020c), which sets strict requirements for synchronous learning. Although virtual schools were established in 2020 as a response to COVID-19, some components of online learning have been mandated in Ontario curriculum since 2019, with students in grades 9-12 required to complete at least two online courses to graduate (Ontario, 2019).

To accommodate this online learning requirement, Ontario's Ministry of Education purchased an $84.2 million license to use D2L (Dream2Learn), Brightspace (D2L), and Ontario's Virtual Learning Environment, in all public-school boards from 2016 to 2028 (PressProgress, 2021). D2L is an online learning management system that allows principals and educators to upload materials, conduct synchronous video-conferenced classrooms, attach curriculum expectations, track student progress and achievement, communicate with students, parents, and staff, and join professional learning communities (D2L, 2022). In addition, D2L allows principals to access school-wide data and track teachers' work (D2L, 2022).

[2] All schools listed in the dataset may not be in operation at the time of publication

Methodology

The data used in this study is derived from a larger study on Ontario principals' understanding and promotion of equity in virtual schools. This study includes data from the English Public and English Catholic systems, with 60 (31 Public & 29 Catholic) school boards (Ontario, 2022). Fourteen principals with at least one year of experience in principalship were interviewed about their experiences leading a virtual school. Interviews were conducted online or by telephone from March to July 2022. The 14 participants were 50% female and 50% male; they came from 13 different school boards, with nine working in the public system and five working in the Catholic system, seven in elementary, four in secondary, and three in K-12.

Participant's identity was kept confidential through the use of pseudonyms. Using pseudonyms in qualitative research can increase the clarity of the research for readers and can help to personalize the data share, thus reflecting the significance of lived experiences (Edwards, 2020). At the end of each interview, I asked the participant if there was a pseudonym they would like to go by. By inviting participants to provide their own pseudonym, I invited the participants to engage in the development of how they would be portrayed in the research, and I ensured they would recognize themselves in the published works (Allan & Wiles, 2016). If the participant indicated a pseudonym, that name was used. If the participant did not indicate a pseudonym, I created one. I aimed to keep participants' pseudonyms reflective of their identity by using names that came from the same or similar ethnic origin as the participant's real name. I do not include a breakdown of whether the participants' pseudonym was chosen by them or me, as this could reveal identifying characteristics which could risk confidentiality.

Data from interviews was analyzed using constant comparative analysis (Glaser & Strauss, 1967). The current study includes only data coded as "program used," limiting the focus to discussions of what programs, applications, or technologies the participant named in their interview. The data referring to online applications or programs was then recoded to its parent company name. For example, "Google Meets" and "Chromebook," were re-coded as Google/Alphabet.

Results showed that Google/Alphabet was the most named technology company, coded 112 times, followed by D2L, which was coded 25 times. Google/Alphabet was used for the Google Suite Education resources, including Google Meets, Google Classroom, YouTube, board-supplied Chromebooks, and Hāpara. D2L was used for the Brightspace learning management system.

Findings

Principals repeatedly discussed the usability of online learning platforms. While most participants worked in school boards that officially sanctioned the use of D2L as the virtual learning platform, all participants reported that, in practice, most teachers were using Google/Alphabet products more often. Only one participant reported using Microsoft 365 as the primary learning platform because their Board sanctioned Teams as the primary learning platform. Other participants reported that students, parents, and teachers did not know how to use D2L Brightspace but were familiar with Google products. As Bruce explained, "When a teacher chooses to use [D2L], kids hate it; […] the familiarity of teachers with it is really part of the problem, too. It's not just that the tool is bad, but kids don't know it and the staff don't know it." Todd also reported that teachers were uncomfortable with D2L, explaining that although D2L was preferred from an administrative perspective, a lack of teacher training and time to learn the D2L platform meant that Google was preferred:

> "I didn't mandate it […] even though they're given the D2L platform, and my expectations are that they use the D2L platform, many of them are not comfortable […] So, they're using the Google classroom […] even though we really don't want that – we want them learning and using D2L […] [But] we have too many teachers that were learning too quickly and were not comfortable. And so even though we did provide training, they still gravitate towards Google Platform."

Likewise, Donna related challenges in mandating D2L, despite being the preferred learning platform, due to students' difficulty navigating the unfamiliar platform: "We tried to get teachers to move to D2L because it's much more powerful […] It's great for teachers. I'm not sure it's the best thing for all students. […] our students found it [more] challenging to use D2L than using Google Classroom." As these findings show, principals recognized that teachers were overburdened with learning new technology, with both teachers and students being unfamiliar with the D2L platform. In order to support their staff and students, principals accepted that teachers would use the Big Tech learning platform they were most familiar with, despite the investment and approval of D2L by the Ministry of Education.

When principals were asked about the strategies they used to facilitate students' access to technology, most principals named Chromebooks as their board-supplied computers. Sam reported that all students in their school received Chromebooks, explaining that Chromebooks were preferable over Apple iPads because they were easier for parents, "Typically, our K-2 students would have iPads, but we gave all the kids Chromebooks because being on a Chromebook was a little bit easier for the kids. Even though they're not proficient typers, it was easier for the parents to go in. […]." Other principals described having Chromebooks available to students upon request. Bruce described Chromebooks as a "matter of right" for students: "We provide anyone who wants or needs, anyone who asks, with a Chromebook, a headset, and a mic. No questions asked about background or need, it's just a matter of right." Similarly, Jamie explained that Chromebook and Wi-Fi hotspots provided access equity to not only students but their families as well:

> "We provide hotspots and Chromebooks […] we removed the barrier. That's how we bring equity because everyone can get a computer if they need it. […] But what also happens is that families access the internet. […] it really increased accessibility for kids and for families at a cost to the school board. But schools exist for youth and families."

Here, principals show how a significant barrier to education – access to technology – has been overcome or at least diminished through the school board's investment in Big Tech products, namely Chromebooks.

When asked about student engagement, some participants shared that they would use a program called Hāpara to monitor students' activity. Hāpara (2022) is a classroom management software that works on Google Workspace through Board issued Chromebooks. One of the tools available to Hāpara (2022) users is Hāpara Highlights, a product that allows educators to monitor students using board-issued Chromebooks. Using Hāpara Highlights, educators can see what tabs the students have opened, and what tabs the students are active on, then educators can message students directly through the application to encourage students to stay engaged.

John described using Hāpara Highlights and finding students who were not engaged: "A teacher can see when Hāpara Highlights is on that a student is not doing their work when they're on a Board issued Chromebook. So clearly, those are the kids that aren't engaged." Hannah also described that when students sign on to their online learning using their school board account, the school can monitor their work, a feature not available to students signing on using a different account or personal not board-issued computer: "we can monitor everything they're doing in their school board account, but if they sign on a different account, they can game all day." Evelyn described using Hāpara to monitor students' engagement but felt uneasy with the inequity in the program being only functional on board-issued devices:

> We've been trialing Hāpara, which gives us visibility only for the students who are using the boards devices. [That] is a whole other equity issue, which bothers me. […] I have tried to reconcile that inequity [by the fact that] at least we are being able to support some students."

Principals are supporting teachers' use of Big Tech software through Hāpara Highlights as a strategy to increase students' engagement through digital surveillance. However, the inequitable application of this software may lead to further inequities, which the principals in this study recognized. In the next section, I discuss this potential inequity in further detail.

Discussion

The results from this study show that the "techification" of education in Ontario's virtual schools is enhanced by principals' intentions to support teachers amidst work intensification and inadequate training, as well as by intentions to support students' engagement in virtual learning. Work intensification refers to circumstances where working conditions change such that the role increases in complexity, with an accompanying increase in time demand, due to societal change (Green & McIntosh, 2001; Kubicek et al., 2014). In Ontario, work intensification has been shown at all levels of education, including principals (Wang et al., 2018) and teachers (Thompson et al., 2022). Work intensification amplified to unprecedented levels when virtual schools opened in September 2020. Teachers placed in virtual schools were asked to learn multiple platforms, new online pedagogical practices, and engage with larger class sizes, all during a global pandemic (Whitley et al., 2022). Likewise, principals experienced unprecedented work intensification when they were tasked with opening virtual schools, supporting students and staff during a global emergency, and responding to widespread community panic around education (Briscoe & Nyereyemhuka, 2022; Pollock, 2020). Recognizing this work intensification and advocating for students and staff accessibility, principals in this study supported the use of Big Tech learning platforms rather than D2L, as staff and students were more familiar with the Big Tech software.

With a similar equity-focused goal, the Ontario Ministry of Education partnered with Big Tech early into the pandemic to enhance equitable access to the technology required for virtual learning (Ontario, 2020b; Smith, 2021; Teotonio & Rushowy, 2020). This quick action shows a commitment to supporting students' access to education. This commitment was reiterated by principals in this study, who all described supplying Chromebooks to any students who requested a device. As one participant pointed out, providing devices not only supports students' access to the necessary technology for learning but also supports families' access to technology. Using these board-issued devices, some teachers gained access to Hāpara Highlights, allowing them to monitor students' activity. In these cases, principals reported Hāpara as a beneficial tool for supporting students' engagement in virtual learning. As these combined findings show, principals reported using Big Tech to support teachers' and students' accessibility and engagement. However, further analysis shows that this reliance on Big Tech for altruistic reasons may problematically heighten the techification of education.

The techification of education through virtual learning platforms may lead to schools creating lifetime consumer loyalty while also commodifying student data. By relying on Big Tech learning platforms and not utilizing the Board-issued D2L platform or diversifying student platforms, students' digital literacy skills become Google literacy (Klein, 2020). When this generation moves into the corporate world, only literate in the digital language of Big Tech, it is Big Tech that determines what knowledge is created, shared, or made obsolete. As a result, schools become training grounds for lifetime consumer loyalty, ultimately supporting Big Tech's profiteering. Likewise, the reliance on Big Tech as a virtual platform commodifies student data for the economic benefit of these for-profit corporations.

An education system that relies on Big Tech "is helping to facilitate Silicon Valley's billions in the short term; in the long term, it is helping Silicon Valley harvest something even more valuable, something that will continue to generate wealth […] And that's our data and that of our children" (Norris, 2021, p.3). To be clear, Google (2022) promises not to sell students' data to third-party corporations, but that is because it does not have to – as a Big Tech giant, Google owns most of its third-party competitors. Just as Big Tech's indoctrination of students into one or a few platforms ensures pupils' commitment to the corporation for their lifetime, Big Tech's massive collection of student data ensures Big Tech will be able to continue to adapt to and prey upon each future generation to come (Klein, 2020). An example of this predatory behaviour is using the student-monitoring software Hāpara Highlights, which only applies to students using board-issued devices.

Research shows that students already marginalized by race, socioeconomic status, ability, or otherwise are the most at risk for not being able to access virtual schooling and are most likely to rely on board-issued devices (Hébert et al., 2021; James, 2021; Tate & Warschauer, 2022). When these students are monitored using board-issued Chromebooks, it sends a message that they are not trusted to use their time appropriately and are under more scrutiny for digital truancy or lack of focus. This heightened surveillance may lead to

these students facing increased disciplinary action due to increased surveillance. Existing research shows that in Ontario, these are the same students who already face heightened disciplinary action (Pollock et al., 2017). Combining these two forms of marginalization shows that the unequal application of student monitoring software like Hāpara may exacerbate the existing education inequities marginalized students already face. In the final section of this paper, I suggest changes at the system- and school-level to help mediate these problematic implications of the techification of education.

Recommendations

To temper the techification of Ontario's virtual schools, I offer recommendations for change at both the policy and school levels. At the policy level, I suggest the Ministry of Education mandate the use of D2L for all boards after providing adequate time and funding for comprehensive professional development for teachers and principals. By mandating the use of D2L, the Ministry will ensure the funds spent on the software contract are being utilized, protect students' data from being commodified by Big Tech, and mediate the Big Techification of Everything by diversifying students' platform familiarity. At the school level, I suggest that student monitoring software be banned unless it can be applied to all students equally. Principals can use their leadership position to enforce a ban on the inequitable use of such programming while still ensuring that students who require access to technology are provided with board-issued devices.

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