The Overreliance on Portable Classrooms in Ontario Schools: New Evidence for the Study of Austerity and Disinvestment in Canadian Public Education

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Abstract

This study investigates the extent of portable classroom use in the province of Ontario between the years 2010 and 2020. The research uses administrative data obtained from the Ontario Ministry of Education and from the 27 largest school boards in the province. The findings reveal that portable classrooms are used as long-term solutions to address enrolment pressures in schools, which is symptomatic of the austerity-driven policies in the funding of Ontario's public education. In addition to providing new evidence of the effects of funding cuts in education, this study repositions infrastructure planning as a critical concern for education policy research.

Keywords: austerity, funding cuts, infrastructure, portable classroom, Ontario

Résumé

Cette étude examine l'étendue de l'utilisation des salles de classe préfabriquées dans la province de l'Ontario entre les années 2010 et 2020. La recherche utilise des données administratives obtenues du ministère de l'Éducation de l'Ontario et des 27 plus grands conseils scolaires de la province. Les résultats révèlent que les salles de classe préfabriquées sont utilisées comme solutions à long terme pour faire face aux pressions d'inscription dans les écoles, ce qui est symptomatique des politiques d'austérité dans le financement de l'éducation publique de l'Ontario. En plus de fournir de nouvelles preuves des effets des réductions du financement dans l'éducation, cette étude repositionne la planification des infrastructures comme une préoccupation essentielle pour la recherche sur les politiques d'éducation.

Mots clés: austérité, coupes budgétaires, infrastructure, salle de classe préfabriqués, Ontario

Introduction

The portable classroom, also known as a mobile, relocatable, or demountable classroom, is a temporary building used primarily to accommodate students in overcrowding schools. Portables are installed adjacent or attached to the main school building when built facilities are insufficient for growing student populations. For school districts, these structures provide a temporary and cost-effective solution when the need for classroom space arises (Gore, 2012). Due to their flexibility and relatively low cost, portable classrooms are a key component in the school infrastructure toolkit in growing school districts across Canada, the United States, and many other jurisdictions (Filardo, 2016). Despite their extensive use in alleviating enrolment pressures, not much is known about the nature, purpose, and use of these structures by school boards.

Investigating the condition and purpose of educational infrastructure could offer relevant insights about public funding and investment in education. Unfortunately, there is a dearth of discussions about infrastructure funding and facilities planning in the education policy fields (Lackney, 2011; Tian & Huber, 2020). This research gap is problematic since several studies have substantiated a link between student learning and the physical

condition of the school building (Byers, et al., 2018; Uline et al., 2009). Seeking to invigorate critical conversations about public education, infrastructure planning, and funding in the Canadian context, the present study offers new evidence to interrogate the current condition of public education in Canadian provinces and territories. A central premise in this study is that overreliance on portable classrooms may be an indication of infrastructure backlogs likely created by budget cuts, austerity, and disinvestment in the funding for school construction and expansions.

In the case of Ontario, the public education sector has experienced significant funding cutbacks (Financial Accountability Office of Ontario, 2020, 2021; Mackenzie, 2017a; Tranjan et al., 2022). Tranjan et al. (2022), for instance, found that per-pupil funding has decreased by an average of $800 between 2017–18 and 2021–22, and the Financial Accountability Office of Ontario (2021) noted that while the drivers for inflation and enrolment were expected to increase education delivery costs by 2.7% annually, the government budgeted an increase of 1% per year, creating a funding gap of $2.9 billion by 2023–24. Adding to these findings, the province reported a $16.3-billion school repair backlog (Rushowy, 2019). The documented backlog in school repair and construction (Mackenzie, 2017b) invites a critical examination of the relations between policy, educational infrastructure, and the provision of high-quality public education. Aiming to advance understandings of the policy context of portable classrooms in Canadian school districts, this study is guided by the following questions: (1) What is the extent of portable classroom use in the province of Ontario between the school years 2010–2011 and 2019–2020? (2) How reliant has the province been on portable classrooms to alleviate enrolment pressures in its largest school boards? (3) What does the use of portable classrooms reveal about the state of education funding and education infrastructure in Ontario?

What Do We Know about Portable Classrooms in Public Schools?

Historical records suggest that portable classrooms have been in use at least since the early 20th century (Educational Technology Publications, 1964), yet scholarly interest in the portable classroom has been sparse, with most studies focusing on issues of air quality, construction, and energy efficiency. After conducting a comprehensive synthesis of the literature, Chan (2009) found mixed results on the effects of portable classrooms on student behaviour, achievement, and teacher morale. Also, Chan (2005) noted that

there were minor differences in attitudes between teachers and students in portable and permanent classrooms. Student misbehaviours tended to occur when travelling between the portables and the main building. Teachers' perceptions of student behaviour in portables were slightly negative compared to permanent classrooms, and elementary teachers tended to have more negative perceptions of portables than middle or high school teachers. Other studies found that while there were no significant differences in math achievement, students in permanent classrooms expressed more positive attitudes toward their school than their peers who were placed in portables (Chan, 2006). McMullen and Rouse (2012) concluded that for schools that have moderate crowding, portables have a small negative impact on reading and language achievement, possibly because of the adverse conditions for learning created through crowding. In contrast, portables were found to have a positive effect on achievement in schools that are severely crowded, probably because they provide much needed classroom relief for learning activities.

While portable classrooms may alleviate overcrowding in the permanent section of the building, the associated increase in overall student numbers often causes congestion in common areas, such as offices, bathrooms, labs, gyms, libraries, and cafeterias (Branham, 2004). The concern is that portables only address classroom-level capacity issues, but common areas may remain crowded, which may create inhospitable environments for students (Ready et al., 2004). Relatedly, Branham (2004) found that schools with temporary structures tend to have lower attendance rates than schools without temporary structures. Further, Shelton's (2003) qualitative investigation of portable use in a school district found that teachers and senior administrators disagree regarding the safety and security issues that may arise in these environments. For example, the distance between the portables and the main buildings may create a disconnect in case of an emergency. Other safety issues include the need for continuous repairs, the poor indoor air quality in classrooms without proper ventilation systems, and longevity. Chan (2009) noted the latter as a source of concern:

> some school districts tend to procrastinate removing their portable classrooms, making temporary portable classroom facilities somewhat like permanent structures on campus. If health and safety are issues in portable classrooms, then, the prolonged stay of portable classrooms in schools will further aggravate the problems. (p. 301)

In relation to safety, Jenkins et al. (2004) investigated the health and environmental conditions of portable classrooms in California, USA. The study found that the more prevalent issues in portable units included: inadequate ventilation, loud classroom and street noise, poor thermal comfort, high indoor formaldehyde levels, moisture problems, toxic residues in floor dust, and inadequate lighting (see also Ribeiro et al., 2016; Shendell et al., 2004). The research team recommended strengthening the state's health and environment regulations, increasing inspections, the development of indoor environmental quality plans, and the creation of best practices and standards for portable classroom construction and placement. Some studies have argued that portable classrooms may have a negative impact on the community perceptions of the quality of local schooling (Blackmore et al., 2011). Taylor et al. (1999) noted that "building attractive permanent school facilities is, in itself, an element in shaping community growth patterns" (p. 706). Relatedly, Schneider et al. (2002) found that the aesthetic outlook of the school influences parental perceptions of school quality.

It should be noted that there is a substantial body of research that explores the relationships between socio-economic background and educational outcomes. At least since the Coleman Report (Coleman et al., 1966), researchers have identified strong connections between the social and economic characteristics of the students and academic achievement. For instance, schools located in racially and economically segregated areas tend to have lower rates of attainment (Reardon et al., 2019), and tend to have higher dropout rates than schools in less segregated areas (Balfanz & Legters, 2004). Unfortunately, the existing research on portable classrooms does not explore these relationships in much detail, which is a limitation for future policy making and planning.

Portable classrooms continue to play a central role in the organization of schooling in most jurisdictions in Canada and the United States, yet little is known about the extent of their use, their role as a form of educational infrastructure, and their impact on student learning and well-being. As noted in this section, studies on this topic are scarce and most were conducted more than 10 years ago. The lack of up-to-date knowledge, and the inconclusive character of the existing evidence, makes it urgent and necessary to investigate the social and educational implications of portable classrooms in more detail.

Reconfiguring Educational Spaces through Disinvestment

Policies that have an impact on educational spaces can undermine public institutions and exacerbate social inequities (Lipman, 2013; Nguyen et al., 2017). Some examples include the pervasiveness of racial and socio-economic segregation within and between schools (Perry et al., 2022), the closure of schools in low-income neighborhoods (Basu, 2007), the disparities in education support programs for racialized and low-income students (Parekh & Brown, 2019), and the intensification of socio-economic gaps between schools through private and parent-driven fundraising (Winton, 2022). These issues demonstrate processes of socio-spatial differentiation that undermine public education (Riveros & Nyereyemhuka, 2023a).

From this perspective, issues of student accommodation can be seen as matters of public policy and should be investigated in the context of larger socio-political processes. Howlett et al. (2020), argued that public policy making involves the interaction of multiple actors at different stages of the policy cycle, namely, agenda setting, policy formulation, decision making, implementation, and evaluation. The portable classroom, for instance, constitutes a policy response to the policy issue of enrolment growth in the context of limited instructional space in schools and shrinking education budgets. It should be noted, however, that the policy process is not linear, since it often intersects with other political processes and ideological frames and, as noted by Dye (1972), an implemented policy solution can generate other policy problems, which would trigger new policy interventions, and so on. As I show below, the school boards' overreliance on temporary structures reveals profound inadequacies in education funding, which is a larger policy issue likely framed by a prevalent political and economic ideology.

In their discussion of the spatial turn in education, Gulson and Symes (2007) pointed out that the spatial configuration of schools is not just an aesthetic choice, but also a product of a policy context. The school building, then, can be seen as the material result of ideologies translated into policies, and when those policies are driven by austerity, they produce educational spaces characterized by neglect and scarcity. In this case, disinvestment and austerity policies are productive, they create social and material realities. It could be argued that schools with permanent portable classrooms are the type of buildings produced through disinvestment. What are the social implications of these spatial reconfigurations of public schools? Whose educational experience becomes compro-

mised by sub-optimal educational facilities? What discourses are mobilized and validated when access to high quality and equitable public education is compromised? A critical examination of the current state of educational infrastructure would reveal the destabilizing effects of neo-liberal reforms in public education.

Briefly, neo-liberalism is a social, political, and economic ideology that proposes that human progress can only be achieved through the creation of markets where individuals must compete to obtain resources. Since markets are meant to regulate all aspects of social life, the state's influence must be limited to the preservation of the markets and nothing else (Harvey, 2007). Under neo-liberalism, education must function as a market where families and students have a range of options depending on their capacity to choose among competing providers (i.e., schools). Some key features of neo-liberal education reforms include deregulation, privatization, and fiscal austerity (Lipman, 2013). By deregulating education, reformers aim to reduce the state's role in the sector and to increase the influence of markets in the organization and functioning of schools and school systems. Privatization is a key component in the development of education markets, as private providers would enter in competition to attract customers. Finally, neo-liberal reforms include the implementation of austerity measures, which compel public schools to cut or reduce services and to seek private funding sources.

Discussing the dynamics of what they call "Actually Existing Neoliberalism," Brenner and Theodore (2002) argued that political and economic reforms that seek to destabilize public institutions operate under the principle of creative destruction. Namely, the concrete, material, and geographically situated strategies that seek to eliminate socially progressive institutions, such as public education, public health, and welfare. Through creative destruction, neo-liberal reformers create market-oriented solutions to social problems, such as privatization. When the public option is made unsustainable through austerity and disinvestment, private options are presented as viable alternatives. While the idea that crises are catalysts for change is not new (Schumpeter, 1942), Brenner and Theodore (2002) remind us that the creative destruction of public institutions does not necessarily follow a predetermined script. Disinvestment in public education infrastructure exemplifies these transformations.

As many educational facilities remain in disrepair and become less welcoming, parents and guardians may be nudged toward considering and supporting alternatives to the public system (Lipman, 2009). The creative destruction of public education requires

weakening the confidence and support of the public so private alternatives could be presented as legitimate and viable (Lipman, 2013). The institutional neglect of educational facilities illustrates one of the many ways in which trust in public education can be eroded. The portable classroom, when reconfigured into a permanent instructional facility, exposes the ideological forces that shape public education, and by extension, it reveals how policy as materiality (Newton & Riveros, 2016) shapes the experiences of educational actors, including students, teachers, and administrators.

Thinking Critically about Educational Infrastructure

An interrogation of the policies and practices around educational infrastructure would shed light on how insufficient funding and decaying facilities undermine the mission of public education (Nguyen et al., 2017). Schools are a form of "social infrastructure" (Klinenberg, 2018) that promote civic life and social growth; thus, prioritizing investment in school facilities could drive sustainable social development (Kaarina & González, 2011). Social infrastructure, including schools, hospitals, and other community-focused buildings, are crucial assets for community building and democratic participation. Klinenberg (2018) argued that absent or decaying social infrastructure could hinder social connections, dialogue, and cooperation. Adding evidence to support Klinenberg's (2018) insights, an emerging body of literature has examined the relationships between facility conditions and student learning. Filardo (2016), for instance, found that new and renovated educational spaces are positively related to academic achievement, and Rudd et al. (2008) reported that students in newer facilities have more positive attitudes toward learning. These findings have been confirmed by subsequent studies (Byers at al., 2018; Maxwell, 2016; Wijayasundara et al., 2020).

When a temporary structure is repurposed as a permanent structure, the primary function of the social service (e.g., education, health) is undermined because temporary structures have been designed for emergencies, their purpose is subsidiary to the institution's primary purpose. In the case of schools, permanent buildings have been designed with pedagogical and educational goals in mind (Bauscher & Poe, 2018; Burke & Grosvenor, 2008; Daniels et al., 2018). The type of facilities, the way the rooms are connected, the social areas, and the quantity and type of rooms available to students and teachers, serve very specific purposes related to socialization and learning (Sayeed,

2022). Indeed, educational facilities can foster and perpetuate inequities; for example, by denying learning opportunities and equitable social experiences to minoritized groups through insufficient labs, under-resourced libraries, inadequate gym space, or the lack of gender inclusive bathrooms (Sayeed, 2022). Klinenberg (2018) argued that the layout of social infrastructure, like schools, could promote or thwart their social and educational mission. As students and teachers navigate between classrooms, hallways, gyms, auditoriums, bathrooms, and offices, they construct a sense of place (Riveros & Nyereyemhuka, 2023b), they build social and material relationships that inform the learning experience. Turning the portable classroom into a permanent fixture of the school has the potential of disrupting these processes by inuring social isolation and disconnect (Branham, 2004). While it is possible to argue that a well-maintained portable classroom could contain all the resources needed to learn, it should be clear that experiencing the school as social space cannot, and should not, be reduced to the classroom experience.

The suggestion here is not to eliminate the portable classroom from the infrastructure toolkit of the school districts. Temporary accommodations are essential in responding to the unforeseen need for student accommodation. The problem arises when these provisional structures become a long-lasting component of school buildings. These situations may result in sub-optimal learning experiences for students. The analysis in this article substantiates the claim that the normalization of portable classrooms as permanent schooling structures is a step further in dismantling public education, undermining its value as essential social good.

Data and Methods

Using frequency analysis and descriptive statistics, this study examined the extent by which portable classrooms have been used in the province of Ontario, Canada, between the school years 2010–11 and 2019–20 (for convenience I will refer to this period as 2010–2020 from here on). The study aimed to test the premise that portable classrooms are temporary solutions to enrolment pressures by identifying the extent to which portables have been used in a 10-year period, and whether the number of portables has increased or decreased during this time. Also, the analysis aimed to determine the average number of years that schools in the sample had portables on site, as well as the average number of portables by school. The sample included 10-year portable and enrolment data

from 2,698 schools in 27 school boards in the largest population centres in Ontario (pop. > 100k) (Table 1). The schools in the sample served an average of 1,289,399 students per year. This sample represents 36% of the total of school boards, approximately 55% of total schools in the province, and nearly 63% of the student population in Ontario.

The dataset used in this research was created by joining 10-year enrolment data from the Ontario Ministry of Education (2010–11 to 2019–20) and 10-year portable classroom records (2010–11 to 2019–20) obtained from the 27 largest school boards in the province. The enrolment data used the "average daily enrolment" (ADE) figure, which is the result of averaging the number of students registered in each school at the beginning and at the end of the school year. I calculated the total of students in each school board by adding the ADE of all the schools included in the sample (Table 1). The portable data were obtained directly from the school boards. The data were carefully reviewed to identify missing values, inconsistences, and duplicates. Tables 1 and 2 present the descriptive statistics of the dataset.

Frequency analysis (Table 3) was used to identify the number of consecutive years portables were kept in schools, as well the number of portables kept during different periods of time. The questions that guided the creation of the frequency tables were: (a) How many schools had 0, 1–4, 5–9, and >10 portables over the study period? and (b) How many consecutive years did each school keep portables? The frequency tables were obtained by using the Frequency (FREQ) function in Microsoft Excel. To answer the first question, the average number of portables per school was logged to one column, then using the FREQ function, four bins were created to sort the schools on a table showing how many schools had 0, 1–4, 5–9, and >10 portables (Table 3). The Jenks natural breaks optimization method was used to create the number of portable number breaks (1–4 / 5–9 / >10). The Jenks natural breaks method is a classification technique for range data that uses an algorithm that finds "natural" classes within a dataset. The algorithm minimizes the average deviation of each class from the mean, while maximizing the average deviation from other classes' means. This technique reveals the inherent groupings within the data. In this case, the algorithm found three prevalent groupings: 1–4, 5–9 and >10. The Jenks natural breaks classification tool in ArcGIS Pro was used to find these breaks.

Interestingly, there were no cases of discontinuous use of portables, that is, once a school received a portable, the portable stayed continuously until removed. In other words, there were no cases of schools that installed, removed, and later reinstalled por-

tables within the sampled period. This suggests that enrolment does not tend to fluctuate (ups and downs) year by year, and that portables are removed only after new accommodation for the over-enrolment in that school has been secured.

To answer the second question, the FREQ function was used to count the number of consecutive years that each school kept portables. The function was programmed to count the consecutive cells on each row that had an observation, independent of the value of the observation. This action returned, in one column, the number of consecutive years that each school had portables. Next, the FREQ function was used to create bins that sorted the schools on a table showing how many schools had portables for 0, 1–4, 5–7, and 8–10 years respectively (Table 3). According to the Ontario Ministry of Education (2023), the expected time for completing a new school construction is four years, thus, using this timeframe as criterion, the breaks for consecutive years with portables were defined as 0, 1–4, 5–7, 8–10. The operative principle here is that a portable that stays in place for more than four years could be considered permanent, since the expected time frame for building a new school has passed. The other breaks (years five, six, seven, and years eight, nine, 10) divide the remaining of the 10-year sample into two equal segments. Finally, after identifying the breaks for data analysis, we conducted a Chi-squared test for independence. The purpose of this test was to determine the statistical significance of the relationship between having portables on site and keeping those portables over time.

Findings: Portable Use and Infrastructure Backlog

The first notable finding is that the number of portable classrooms in the 27 largest school boards in Ontario remained stable over the 10-year period (1.3% change overall) (Table 2) with an annual average of 5,279 portables in 10 years. In contrast, the number of students in the sample increased by 10.6% overall (Table 2). This suggests (a) that the province had a significant schooling infrastructure backlog in 2010, and (b) that the province had made little progress in addressing this backlog by 2020. It should be noted that the number of schools in the 10-year period increased by 5.4%; that is, there were 155 more schools in the sample by 2020. This increase, however, seemed insufficient given the continued dependency on portable classrooms over the study period.

The number of portables used in a school would indicate the degree by which the

demand for schooling spots outpaced the available supply in that school. The frequency analysis (Table 3) revealed that 1,822 schools, namely 65.5% of schools in the sample, had at least one portable classroom during the 10-year period. Dividing the average of portables used in the sample over 10 years (*n* = 5,279.6) by the average number of schools that used portables (*n* = 1,822), reveals that each school had an average of three portables. This picture could further be expanded by grouping the schools by number of portables during the 10-year period (Table 3). For instance, 1,362 schools (49% of the sample) had between one and four portables during the 10-year period, 392 schools (14%) had between five and nine portables, and 68 schools (2.4%) had more than 10 portables between 2010 and 2020. In contrast, 962 schools, or approximately 35% of the sample, had no portables on site during the sampled period.

In addition to finding the number of portables used over 10 years, the frequency analysis showed how long schools kept portables on site (Table 3). While there are no stated criteria to determine how long is temporary, it could be surmised that provisional classrooms would be required until a permanent brick and mortar classroom/school is constructed, or until the overcrowding situation is resolved. In Ontario, the time frame for building a new school is between two and four years, thus, using portables for more than four years goes beyond the ideal or expected utilization timeframe. The analysis revealed that 568 schools (20.4% of the sample) had portables between one and four years, 403 (14.5%) kept portables between five and seven years, and 851 (30.6%) had portables between eight and 10 years. These findings show that that in many cases, portable classrooms are used as permanent structures, since 45% of schools in the sample had portables on site between five and 10 years. Further, a Chi squared test for independence revealed a statistically significant association between average number of portables per school and the number of years that portables remain on site: X^2 (4, *N* = 1,822) = 137.83 *p* = < .05 This suggests that keeping portables over time after receiving them is not a random occurrence, which gives additional support to the concern that portables are used as long-term solutions to enrolment pressures.

Table 1: *Enrolment, Schools, and Portable Counts by Board*

City	Boards Sampled	Type	Average Enrolment 2010–20	Enrol change 2010–20	% Enrol Change 2010–20	SD Enrol 2010–20	Average Schools 2010–20	Change Schools 2010–20	% Change Schools 2010–20	SD Schools 2010–20	Average Port 2010–20	Change Port 2010–20	% Change Port 2010–20	SD Port 2010–20
Barrie	Simcoe Muskoka Catholic DSB	Cath	20289.6	1854.7	9.3	1035.5	49.3	1	2.0	0.8	114.9	-46	-27.9	22.4
	Simcoe County DSB	Pub	46419.0	9035.3	21.2	3686.2	94.3	10	11.1	3.5	237.5	75	35.0	28.0
Burlington, Milton, Oakville	Halton Catholic DSB	Cath	24607.6	6114.5	28.3	2370.3	35.8	6	18.8	2.1	25.7	37	284.6	15.2
	Halton DSB	Pub	56485.1	15817.6	33.1	5795.0	97.1	10	11.0	3.9	299.9	102	42.1	35.8
Guelph	Wellington Catholic DSB	Cath	3777.5	543.5	15.7	177.3	11.9	1	9.1	0.3	14.1	-12	-54.5	6.3
	Upper Grand DSB	Pub	25357.0	1731.0	7.1	693.2	52.7	4	8.0	1.8	124.0	-15	-10.9	14.8
Hamilton	Hamilton-Wentworth Catholic SB	Cath	27281.5	2224.8	8.3	1019.5	54.4	0	0.0	0.8	148.8	-40	-21.9	23.8
	Hamilton-Wentworth DSB	Pub	27138.7	3481.8	13.7	1445.8	59.0	0	0.0	0.8	166.5	-53	-24.7	27.2
Kingston	Algonquin & Lakeshore Catholic DSB	Cath	10717.2	560.3	5.3	379.9	36.3	1	2.8	0.5	61.4	-10	-13.5	5.5
	Limestone DSB	Pub	16194.5	3485.5	23.9	1190.9	56.0	7	13.5	2.5	50.0	-9	-17.3	6.4
London	London District Catholic School Board	Cath	18982.4	1768.1	9.1	1205.8	51.3	2	4.0	0.9	55.7	3	3.7	16.0
	Thames Valley DSB	Pub	69915.1	12629.7	19.5	4738.6	154.6	7	4.6	2.3	196.6	21	10.5	15.1

City	Boards Sampled	Type	Average Enrolment 2010–20	Enrol change 2010–20	% Enrol Change 2010–20	SD Enrol 2010–20	Average Schools 2010–20	Change Schools 2010–20	% Change Schools 2010–20	SD Schools 2010–20	Average Port 2010–20	Change Port 2010–20	% Change Port 2010–20	SD Port 2010–20
Mississauga -Brampton	Dufferin-Peel Catholic DSB	Cath	79579.6	-2499.9	-3.1	1039.2	146.7	6	4.2	1.9	343.0	-76	-20.9	25.8
	Peel District School Board	Pub	146152.1	16707.0	12.2	6685.0	240.3	29	12.9	10.1	610.2	-87	-13.4	31.9
North York	York Region DSB	Pub	117983.1	17004.7	15.5	6212.5	204.3	20	10.4	6.8	403.4	110	32.2	36.3
Niagara, St, Catharines	Niagara Catholic DSB	Cath	21373.5	-1354.1	-6.2	535.1	57.0	0	0.0	0.0	117.0	-73	-48.7	22.6
	District School Board of Niagara	Pub	33482.2	6761.7	21.9	2757.0	94.0	6	6.6	2.2	55.6	32	64.0	11.8
Oshawa	Durham Catholic DSB	Cath	20801.9	136.7	0.6	348.0	44.0	3	7.1	1.2	104.8	-18	-14.3	16.7
	Durham DSB	Pub	41076.0	10546.0	29.8	4226.0	89.7	10	11.9	3.6	195.1	58	37.7	30.7
Ottawa, Kanata	Ottawa Catholic School Board	Cath	39175.1	8503.2	23.4	3188.7	95.7	5	5.4	1.8	268.7	59	23.0	26.2
	Ottawa-Carleton DSB	Pub	64906.7	8712.0	14.2	3416.7	137.5	8	6.0	3.0	339.7	88	30.9	31.6
Toronto	Toronto Catholic DSB	Cath	48480.8	3925.3	8.5	1854.0	99.8	1	1.0	0.6	327.9	-110	-28.0	39.4
	Toronto DSB	Pub	218115.6	9855.6	4.6	5527.5	517.6	6	1.2	2.5	494.4	-19	-3.8	8.1
Waterloo, Kitchener	Waterloo Catholic DSB	Cath	20872.5	3593.7	17.8	1535.4	47.4	2	4.3	0.8	106.5	32	27.1	19.0
	Waterloo Region DSB	Pub	60304.3	7946.2	14.1	3154.7	116.2	7	6.2	2.7	294.6	1	0.3	21.8
Windsor	Windsor-Essex Catholic DSB	Cath	12160.3	-210.2	-1.6	398.4	23.3	1	4.3	0.5	58.3	-16	-23.9	8.5
Windsor, Essex	Greater Essex County DSB	Pub	17770.0	3469.7	21.9	1464.1	31.5	2	6.7	0.7	65.3	35	62.5	15.4

Table 2: *Descriptive Statistics*

Sample Total Enrolment 2010	,219,029.0
Sample Total Enrolment 2020	1,371,374.0
2010–20 Average Enrolment (total sample)	1,289,398.8
2010–20 Enrolment Change	152,344.3
% Enrolment Change	10.6
2010–20 Average School No. (Total Sample)	2,697.7
2010–20 School No. Change	155.0
% School No. Change	5.4
2010–20 Average Portables No. (total sample)	5,279.6
2010–20 Portables No. Change	69.0
% Portable No. Change	1.3

Table 3: Frequencies

a. How many schools have 1–4, 5–9, >10 portables?

Portable Quantity	Frequency	% of Sample
0 Portables	962	34.6
1–4 Portables	1362	48.9
5–9 Portables	392	14.1
> 10 Portables	68	2.4

b. How long do schools maintain portables?

No. of Years	Frequency	% of Sample
0 Years	962	34.6
1–4 Years	568	20.4
5–7 Years	403	14.5
8–10 Years	851	30.6

The average quantity of portable classrooms varies substantially between school boards (Table 1). For instance, Peel District School Board, the second largest school board in the province, had an average of 610 portables per year over the study period, the highest annual average in the sample, while the Wellington Catholic School Board, one of the smallest boards, used an average of 14 portables per year, the lowest in the sample. In most cases, larger school boards have a larger portable utilization over the 10-year period (Table 1), probably because accommodation issues tend to scale up when the school board size increases. For instance, the three largest school boards in the sample, Toronto Public School Board, Peel District School Board, and York Region School Board, were the top three portable users between 2010 and 2020. It should be noted, however, that while it is true that larger school boards tend to use more portables, the data reveal some exceptions. For example, Thames Valley District School Board is 5th in average enrolment, but 11th in average portable use over 10 years, and the District School Board of Niagara is 13th in average enrolment, but 24th in average portable use.

Additional and intriguing findings emerge from a close examination of Table 1. For example, there are cases where, despite enrolment decline, the average number of portables over the 10-year period was high relative to other boards. Dufferin-Peel Catholic School board reduced its enrolment by 2,500 students (-3.1%), yet it was the fourth largest user of portables during this time, with an average 343 portables per year. It should be noted that the district opened six new schools and decreased its portable count significantly between 2010 and 2020 (-110), yet these changes clearly seemed insufficient to address the accommodation issues. Based on this data, it would be difficult to present an explanation for these discrepancies. It could be hypothesized, however, that this district, like many other districts in Ontario, went through a period of aggressive restructuring due to the neo-liberal reforms initiated in the late 1990s. As reported by Basu (2007), school closures and consolidations were widespread during the early 2000s, which may have put school boards in a precarious position to respond to any shifts in enrolment. It is possible that this district was already experiencing enrolment and accommodation issues by 2010. This circumstance, combined with a scarcity-driven funding model, may have caused a high dependence on portables in the 2010–2020 decade, as noted in Table 1.

There is another metric reported in Table 1 that invites closer examination: the standard deviation (SD) of average portable counts and average enrolment between 2010 and 2020. The existence of high standard deviations on a dataset suggests the that the

data is more spread out from the mean; in other words, that there are more extreme values in the data. The largest SD for average portable counts is 39.9 (Toronto Catholic District School Board), followed by another five districts, which have SDs between 30 and 40 (Table 1). This finding could be interpreted as showing that within these school boards, portable use is not completely homogenous, but probably more prevalent in certain areas or schools. These would be the extreme values that produce a high SD. Comparing the average portable SD with average enrolment SD would reveal the school boards with more variability in enrolment and portable use; that is, school boards where enrolment and portable use increased, not homogenously, but more in certain areas than others. Table 1 shows that York Region District School Board (Enrolment SD: 6,212, Portable SD: 36.3), the Peel District School Board (Enrolment SD: 6,685, Portable SD: 31.9), and the Halton District School Board (Enrolment SD: 5,795, Portable SD: 35.8) are the boards with the highest simultaneous variability in these two metrics. This could be interpreted as an indication that some schools within these school boards are experiencing more enrolment pressures than others, otherwise their SDs would be lower, suggesting a more homogeneous distribution of the values within the dataset. The Toronto District School Board offers an interesting case of homogeneity in the distribution of portables, the opposite of the cases discussed above. The SD for the average portable count in this board is 8.1, one of the lowest in the sample. This could be seen as an example of low variability in the values, that is, more uniformity and closeness to the mean. A low SD in the average portable count could be interpreted as a more homogenous distribution of portables among the schools in the sample—in other words, fewer extreme cases of schools with more portables that the average. It could be hypothesized that portable counts are more evenly distributed—perhaps the schools sampled had a relatively similar number of portables in this school board.

Another metric that could give an indication of the extent of disinvestment in the K–12 sector is the low levels of school construction in this period. Table 2 shows that 155 new schools were added to the sample between 2010 and 2020. Two school boards alone, out of 27, added 47 new schools (31.6% of new schools), three school boards added 10 each (19.3% of new schools), nine school boards added between five and eight schools each (37.4% of new schools), five school boards added between two and four schools (8.3% of new schools), five school boards added only one school each in the 10 year period (3.2% of new schools), and three school boards did not build new schools during

this period. The school boards that did not add schools had an average of 144 portables each, and the schools that added one school had an average of 155 portables, although this number is skewed by the two boards that had a high portable count within this group: the Toronto Catholic District School Board (avg. 328 portables) and the Simcoe Muskoka Catholic District School Board (avg. 115 portables). It is worth noting that the two school boards that added the most schools are some of the largest school boards in the province, which probably explains the difference as a function of the boards' size, however, this is not necessarily the case for other large boards. The Toronto District School Board added six schools and maintained an average of 494 portables during the 2010–2020 period. This finding, combined with the fact that this school board had a low standard deviation in average portable use, could suggest that in the face of austerity and dwindling funding for school construction, school boards may be compelled to scatter portables across several neighbourhoods in lieu of new schools.

While an investigation of the direct and indirect causes of enrolment pressures in large Ontario boards are beyond the scope of this article, it could be hypothesized that these pressures are likely associated with the school boards' reduced ability to respond to emerging socio-economic trends related to labour demand, increased migration to large urban centres, the instability of housing markets, and the resulting shifts in residential patterns (Filion, 2015, Walks, 2020; Walks & Soederberg, 2021). To respond to these pressures schools must secure funding from the Ministry of Education, which will approve new projects only after all possible accommodation alternatives have been exhausted, including school consolidations, re-drawing of catchment areas, and sharing facilities with coterminous boards (Ontario Ministry of Education, 2021). One consequence of this model is that it makes facilities funding (i.e., capital funding) contingent on current and demonstrated need. That is, a new school or school addition is only considered for funding by the Ministry when overcrowding is already present. The problem with this strategy is that it exacerbates the construction backlog since schools must be already overcrowded for the board to receive the funding to build.

Not only does the strategy of making funding contingent on demonstrating current need have the potential of maintaining enrolment pressure as unaddressed for several years, but also, it could make the issue worse. There are, in fact, documented cases of brand-new schools receiving portables shortly after opening (Lupton, 2021), or new schools opening with portables already on-site (Newcombe, 2022). The outstanding re-

pair backlog of $16.3 billion (Rushowy, 2019) and the stable levels of portable classroom use over the 10-year period of the study, provides evidence that the K–12 education sector has been subjected to extraordinary levels of austerity. Rushowy (2019) reported that the Ontario Ministry of Education has expressed its commitment to spend $13 billion over 10 years, which again, partially addresses current need by taking $1.3 billion drops, every year, from a $16.3 billion bucket that keeps growing. This invites the question: What will the disrepair backlog bucket look like in 10 years?

The Overreliance on Temporary Student Accommodation: A Warning Sign for Education Infrastructure Planning in Ontario

With only three exceptions, most school boards in the sample experienced an increase in their enrolment numbers (10.6% overall) (Table1, Table 2). Supporting this insight, Statistics Canada (2022) reported that the fastest growing municipalities in Canada, and in Ontario in particular, are inside or close to urban areas, with urban spread continuing to exert pressure for the delivery of services, including education (Statistics Canada, 2022). It should be noted, however, that the Declining Enrolment Group, a group appointed by the Ministry to investigate enrolment issues in Ontario, projected that the only areas that would see enrolment increase in the 2010–2020 decade are the large metropolitan areas in the Greater Toronto Area (GTA). Despite this warning, which was issued in 2009, this study found that some of the school boards with the largest portable counts are in fact, located in the GTA (Table 1). Enrolment pressures, however, are not exclusive to the GTA—most large urban centres in Ontario used portables consistently. Evidently, the overreliance on portable classrooms, particularly in times of demographic growth, highlights the tremendous financial constraints imposed on school boards and reflects the disinvestment that has shaped the structure and functioning of many educational systems in Canada and around the world (Adamson & Åstrand, 2016). By normalizing portable structures as permanent buildings, the education system ends up shortchanging students and families in its promise to deliver quality public education opportunities for all students. Through these politics of neglect, private options can be presented as viable and legitimate, shifting the public's support for public education.

This study is limited by the type and characteristics of the data. The structure of the dataset does not allow inferences about student experience or to provide a more

fine-grained description of the socio-economic characteristics of the students who use portables. Future research on this topic could engage qualitative inquiry to investigate the experiences, both positive and negative, of students, teachers, and administrators in relation to portable classrooms. It is possible, for example, that for a school located in a quiet neighborhood, the distance from the main building may enhance some students' sensory experiences by providing seclusion and quiet. Other promising areas of research could involve merging the dataset with census data to investigate the socio-economic characteristics of the communities that receive portables. Also, merging the dataset with standardized achievement data at the school level could provide insight into the relations between portable classrooms and achievement, broadly constructed. It should be noted that while the dataset includes school-level data, grade-level information was not provided. Finally, and as noted above, the variability in standard deviations in average portable count and average enrolment identified in Table 1 suggest that the distribution of portables and enrolment pressures are not homogenously distributed within the examined school boards. Some boards in the sample had larger variability in these two metrics, which suggests that some schools within these boards had more enrolment and more portables than others. These findings could be further explored by geocoding the dataset and exploring the possible spatial clustering of portable use within specific geographical areas. Similar investigations could be conducted in other Canadian provinces to determine the extent of this phenomenon across the country.

This research aims to recast the investigation of educational infrastructure as an educational policy issue (Lackney, 2011). Politics are materialized through policy, and these materializations can mobilize discourses that shape social experiences. Since teaching and learning do not occur in a vacuum, a critical interrogation of the physical environment of schooling becomes an essential condition for delivering equitable learning experiences for all students.

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