



 **K-12**
Education Reform
in Alberta

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Contents

Executive Summary / i

Introduction / 1

1 Background on Alberta’s K-12 Education System / 2

2 Improving Alberta’s Public School System / 11

3 Unleashing Innovation in Independent Schools / 18

4 Lessons from British Columbia / 26

5 Conclusion and Recommendations / 31

Appendix—Detailed Savings / 32

About the Authors / 35

Acknowledgments / 36

Publishing Information / 37

Purpose, Funding, and Independence / 38

Supporting the Fraser Institute / 38

About the Fraser Institute / 39

Peer review—validating the accuracy of our research / 39

Editorial Advisory Board / 40

Executive Summary

Primary and secondary (K-12) education is one of the most important services supported by provincial governments as it provides the next generation with the foundation of knowledge, experience, and skills necessary for their success as adults. It is the second largest area of provincial program spending, second only to health care. Thus, ensuring that families have access to an excellent education in a fiscally responsible manner is an important public policy goal for all provincial governments.

The status quo of K-12 education in Alberta is concerning. Alberta's inflation-adjusted per-student spending in government schools grew 17.5% between 2005/06 and 2014/15 (latest year of comparable data). Per-student spending in Alberta is above the national average (\$13,115 compared to \$12,646) and well above neighbouring British Columbia (\$11,216). At the same time, international test scores such as PISA show performance declines. In mathematics, for instance, Alberta's score has declined in both comparative and absolute terms. Whereas Alberta used to outperform both, it now ranks below British Columbia and is essentially tied with Ontario. No province except Manitoba has experienced greater declines in math scores since 2005/06. The government's own Provincial Achievement Tests also show a downward trend.

In short, spending is up but student outcomes are down. This publication discusses a number of policy changes that can help reverse these trends. The reforms fall into two broad categories: those primarily related to government schools and those primarily related to independent schools.

There are three reforms in the first category. The first, based on a comprehensive literature review by education analyst Vicki Alger, relates to teacher incentive pay. Alger concluded that when teacher incentive pay systems are structured correctly, including clear expectations, focus on real improvement rather than simply higher test scores, and a long-term commitment, gains in educational performance can be achieved. Introducing pilot programs for incentive-based compensation is a suggested first step in a larger process of improving incentives for teachers.

The second reform focuses on how to expand the role of charter schools. Research demonstrates charter schools are particularly effective at improving the performance of "underserved" groups such as lower-income students and ethnic minorities. The suggested reforms include removing the discretionary authority of local school boards to reject charter school applications, eliminating the cap on the number of charters, and clarifying criteria for ministerial approval.

The final area of reform within the government sector relates to open enrolment, which is the ability of families to easily choose schools outside their attendance area. Alberta already has a certain degree of open enrolment. Maintaining and expanding the commitment to open enrolment is critical given the success of the existing policy.

The second broad category is that relating to independent schools—private institutions that exist outside the government system. Alberta currently provides families who choose to educate their children at an independent school grants of either 60% or 70% of the per-student operating amount provided to government schools. One suggested reform, based on recent innovations introduced in Australia, is to provide larger grants to lower-income families to improve financial accessibility to independent schools. Specifically, the recommendation is to introduce a scaled grant from 70% to 90% depending on household income.

The next recommendation is to change the eligibility regulation for independent schools to include for-profit schools. This reform is based on Sweden's experience: as part of an overhaul of its education system, Sweden expanded the use of independent schools and included for-profit providers. For-profit schools, and in particular chains, are now the dominant provider of independent K-12 education in Sweden.

The final recommendation, which also has implications for the government school sector, calls for competition in curriculum. Under current regulations, independent schools receiving grants must adhere to the provincial curriculum. A more productive approach would be to focus on common learning outcomes and allow greater diversity (that is, competition) in the curriculum and content used to achieve them.

Given the gap between spending and performance, the reforms outlined in this paper for both the government and independent education sectors offer the opportunity to improve the performance and cost-effectiveness of Alberta's schools.

Introduction

Primary and secondary education, hereafter referred to as K-12 education, is one of the most important services supported by government. It offers the next generation the opportunity to acquire the knowledge, experience, and skills necessary to be successful. It is also one of the most expensive areas of provincial public management. In the 2018/19 fiscal year, Alberta will spend \$8.0 billion on K-12 education, representing one out of every six dollars of provincial program spending. This makes K-12 education the second largest area of program spending for the government of Alberta, second only to health care.¹

Given the importance and cost of educational services, ensuring that families have access to world-class education in a fiscally responsible manner is one of the most important ongoing public policy challenges facing Alberta.

This paper is designed to first provide interested Albertans with some background on the province's K-12 education system, including its delivery structure, costs, and some select performance data. The paper then summarizes a host of potential reforms for both the government school system as well as for independent schools.² The paper concludes with a brief overview and summary of the reforms presented.

1. Alberta, Treasury Board and Finance (2018). *2018-19 First Quarter Fiscal Update and Economic Statement* (August 2018). <<https://open.alberta.ca/dataset/9c81a5a7-cdf1-49ad-a923-d1ecb42944e4/resource/5a687728-d8ff-49b7-891f-575f58115028/download/2018-19-1st-quarter-report-fiscal-update.pdf>>.

2. The paper does not cover potential reforms to the province's home-schooling sector, which continues to grow and represents an important part of the overall education system in the province. For more information on home schooling, please see: Deani Neven Van Pelt (2015). *Home Schooling in Canada: The Current Picture—2015 Edition*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/home-schooling-in-canada-2015-rev2.pdf>>.

1 Background on Alberta's K-12 Education System

Prior to examining the overall spending and some performance measures of Alberta's K-12 education system, this section reviews some of the basics of how K-12 education is delivered in the province. Like all Canadian provinces, Alberta's K-12 education system is a mix of government and independent schools. The public or government system of schools dominates overall enrolment. As depicted in [Figure 1](#), in 2014/15, the most recent year of comparable data, 94.1% of Alberta students were enrolled in a government school.³ Alberta's government school enrolment as a proportion of total enrolment ranked sixth highest in the country, higher than British Columbia, Manitoba, Ontario and Quebec. Only the Atlantic provinces and Saskatchewan had higher rates of government school enrolment.

The government school sector in Alberta is composed of the following types of schools: 68.1% of students are enrolled in an Anglophone government school; 1.1% in a Francophone government school; 23.5% in a Separate (Catholic) government school; and 1.4% in a Charter school.⁴ It's worth noting that charter schools are unique to Alberta within Canada,⁵ and that Alberta is one of three provinces (along with Ontario and Saskatchewan) that deliver religious education, and in particular Catholic education, within the government school system.⁶

The remaining students are enrolled in independent schools or educated at home (home schooling). Independent schools exist wholly outside of the public system. They are privately owned by non-profit organizations or charities. Often they have a particular educational focus such as alternative pedagogies (Montessori and Waldorf), religion, or academic orientation—with a heavy focus, for instance, on science, technology, engineering and mathematics (STEM). In 2014/15, the latest available data comparable across provinces, Alberta had 29,400 students enrolled in independent schools, representing 4.4% of all enrolment.⁷

Alberta is one of five Canadian provinces that provide financial support to parents choosing independent schools. Accredited independent schools receive grants amounting

3. Angela MacLeod and Sazid Hasan (2017). *Where Our Students Are Educated: Measuring Student Enrolment in Canada, 2017*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/where-our-students-are-educated-measuring-student-enrolment-in-canada-2017.pdf>>: table 4.

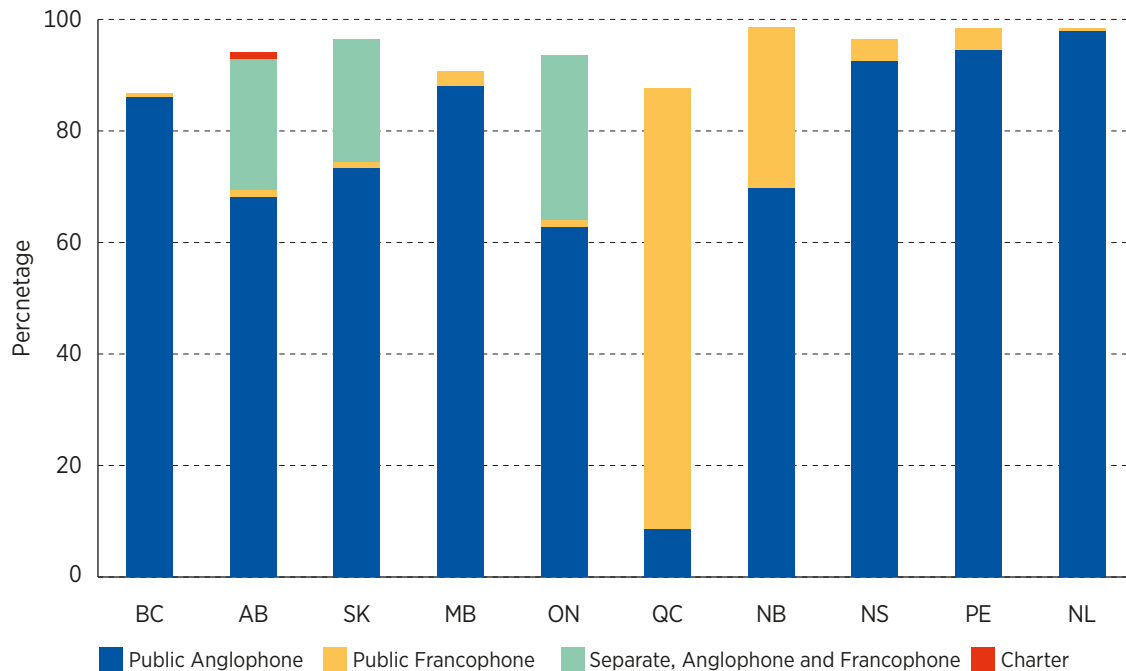
4. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 4.

5. For more information on Alberta's charter schools and indeed charter schools in general, please see: Lynn Bosetti, Brianna Brown, Sazid Hasan, and Deani Neven Van Pelt (2015). *A Primer on Charter Schools*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/primer-on-charter-schools.pdf>>; and Paige T. MacPherson (2018). *An Untapped Potential for Educational Diversity: Policy Lessons from Alberta Charter Schools*. Atlantic Institute for Market Studies. <http://www.aims.ca/wp-content/uploads/2018/09/AIMS-18004_AlbertaCharter_SP2418_F2.pdf>.

6. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 4.

7. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 5.

Figure 1: Public school enrolment as a share of total enrolment, by type of school, 2014/15



Source: MacLeod and Hasan, 2017, *Where Our Students Are Educated*: figure 6.

to 60% or 70% of the per-student operating funding provided to public schools in the comparable region, which reduces the costs directly borne by parents.⁸ Despite having the second-highest grant levels in the country,⁹ and rather large growth in the number of students attending independent schools over the last decade, Alberta only ranked fifth in the level of independent school enrolment in the latest data, behind British Columbia, Quebec, Manitoba, and, perhaps most interesting of all, Ontario, which does not provide any assistance to parents choosing independent schools (figure 2). The comparatively low level of independent school enrolment in Alberta is likely a result of a combination of factors, including the provision of Catholic education and other religiously focused education within the government school system, the presence of charter schools, and a comparatively high level of home schooling.¹⁰ In 2014/15, 1.4% of Alberta students were educated at home, which was the second highest rate of home schooling¹¹ in Canada, behind only Manitoba.¹²

8. Deani Van Pelt, Sazid Hasan, and Derek J. Allison (2017). *The Funding and Regulation of Independent Schools in Canada*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/funding-and-regulation-of-independent-schools-in-canada.pdf>>.

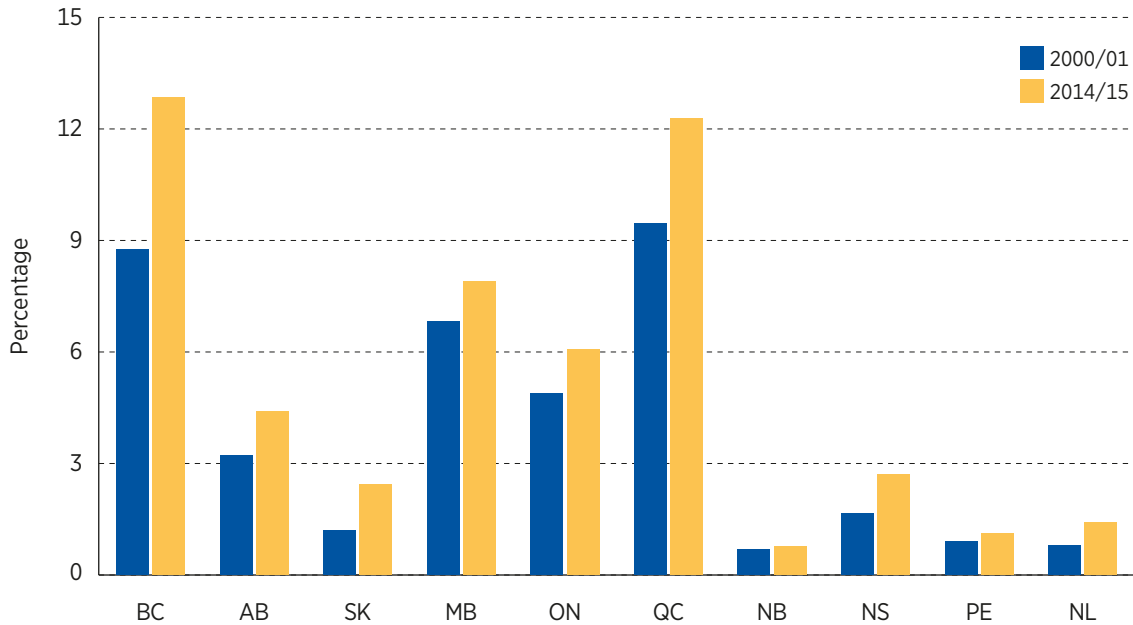
9. Saskatchewan's "associate schools" receive a grant of 80% of the per-student operating amount that is provided to public schools. For more information, see: Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

10. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 6.

11. For more information on home schooling in Canada, please see: Van Pelt (2015). *Home Schooling in Canada*.

12. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 6.

Figure 2: Independent school enrolment as a share (%) of total enrolment, 2000/01 and 2014/15



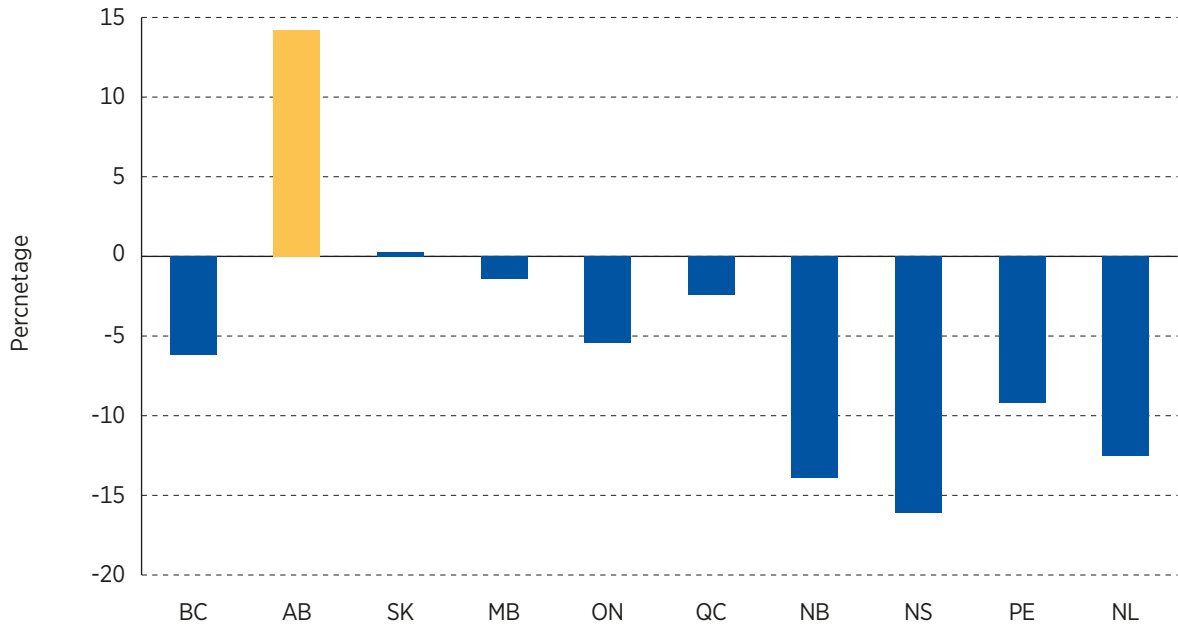
Source: MacLeod and Hasan, 2017, *Where Our Students Are Educated*: figure 6.

Alberta is one of only two provinces that has experienced growth in its overall K-12 enrolment over the last decade. **Figure 3** illustrates the change in student enrolments for each of the provinces between 2005/06 and 2014/15, the latest year of available comparable data. Alberta's 14.1% growth in student enrolment far outpaced the only other province to record an increase, Saskatchewan at 0.3% growth. The other provinces all experienced a decline in student enrolment, ranging from a low of -1.4% in Manitoba to a high of -16.1% in Nova Scotia.

The changes in student enrolment are critical to an accurate understanding of K-12 education spending over the last decade. **Figure 4** shows the per-student spending, adjusted for inflation, for each of the provinces as well as the Canadian average for 2005/06 and 2014/15, the latest year of comparable data. Alberta's per-student spending in government schools grew 17.5% between 2005/06 and 2014/15, after adjusting for the effects of inflation. Per-student spending in Alberta remains above the national average: \$13,115 compared to \$12,646. Finally, Alberta's per-student spending is markedly above (16.9% higher) British Columbia's comparable spending: \$13,115 versus \$11,216.¹³ British Columbia is an important comparator for Alberta for a number of reasons, including its markedly different approach to K-12 delivery, its lower costs, and generally better results. A later section in the report will more fully detail this comparison between the two provinces.

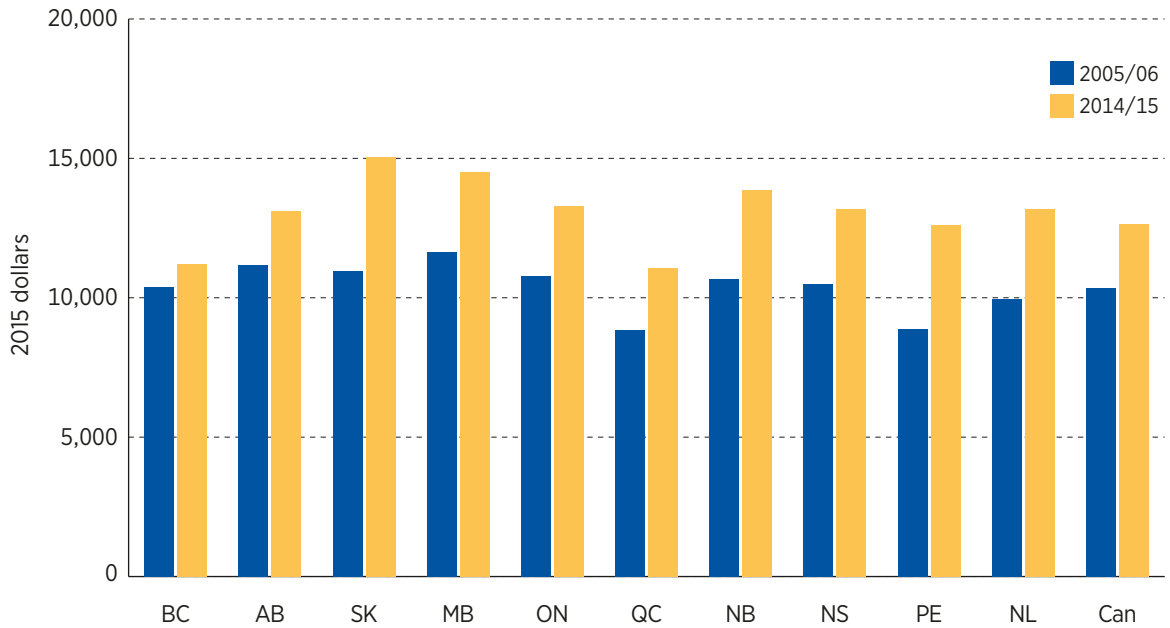
13. Angela Macleod and Joel Emes (2017). *Education Spending and Public Student Enrolment in Canada, 2017 Edition*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/education-spending-and-public-student-enrolment-in-canada-2017.pdf>>.

Figure 3: Change in student enrolment in government schools, 2005/06–2014/15



Source: MacLeod and Emes, 2017, *Education Spending and Public Student Enrolment in Canada*: table 2.

Figure 4: Spending per student in government schools, inflation adjusted, 2005/06 and 2014/15

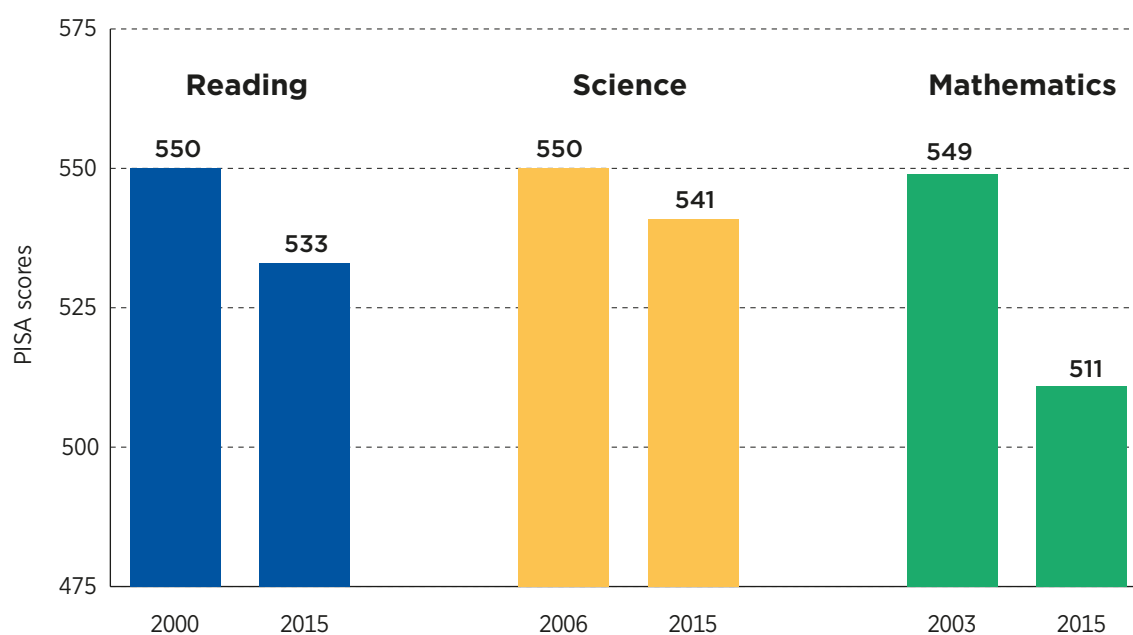


Source: MacLeod and Emes, 2017, *Education Spending and Public Student Enrolment in Canada*: table 2.

Of course, higher per-student spending in Alberta is not necessarily problematic if the higher spending is accompanied by better results and performance. The evidence, however, does not suggest that the higher spending in Alberta is resulting in better performance. In fact, British Columbia—despite per-student spending nearly 17% lower than Alberta’s—performs approximately as well or better than Alberta on many measures of student academic achievement.¹⁴

The Programme for International Student Assessment, or PISA, is a recognized standard for internationally comparable testing. It is administered by the Organisation for Economic Cooperation and Development (OECD).¹⁵ Figure 5 illustrates the PISA test results for Alberta from the first comparable year of data to the most current year available, 2015, across all three areas of testing: reading, science, and mathematics. Alberta has experienced a decline in its provincial score in all three areas between the first year of comparable data—2000 for reading, 2006 for science, and 2003 for mathematics—and the most recent data, 2015. It’s important to note, however, that while the province experienced a decline in all three areas, only the decline in mathematics was deemed statistically significant.¹⁶

Figure 5: PISA scores for Alberta, selected years



Sources: O’Grady, Deussing, Scerbina, Fung, and Muhe, 2016, *Measuring Up*; OECD, 2018: various PISA reports.

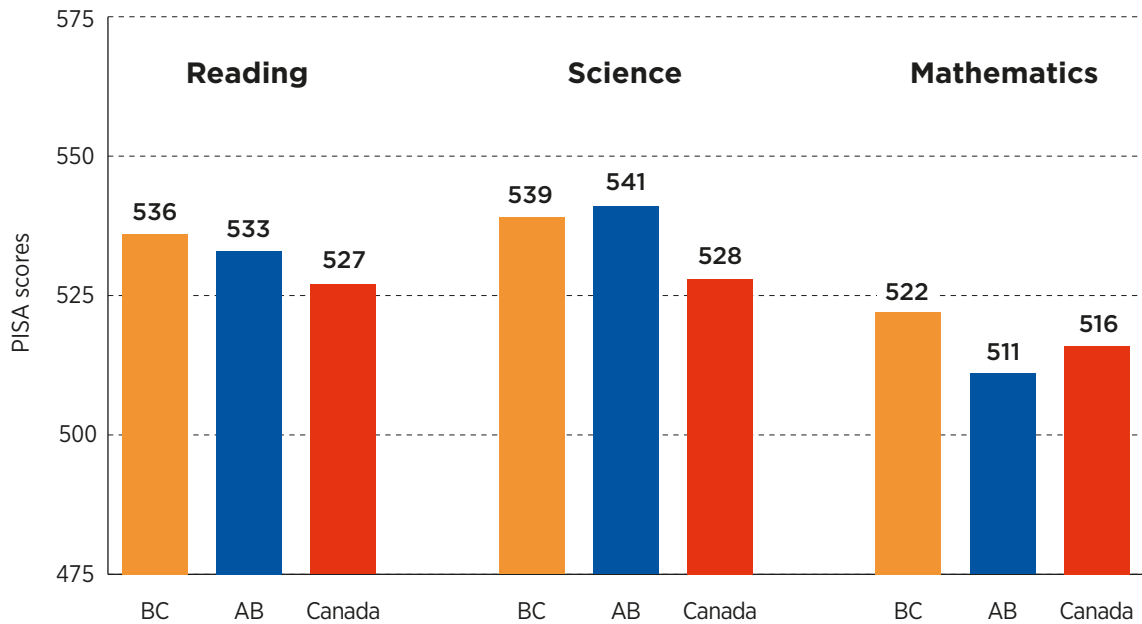
14. Kathryn O’Grady, Marie-Anne Deussing, Tanya Scerbina, Karen Fung, and Nadia Muhe (2016). *Measuring Up: Canadian Results of the OECD PISA Study: The Performance of Canada’s Youth in Science, Reading, and Mathematics. 2015 First Results for Canadians Aged 15*. Council of Ministers of Education, Canada. <<https://www.cmec.ca/Publications/Lists/Publications/Attachments/365/PISA2015-CdnReport-EN.pdf>>.

15. Organisation for Economic Co-operation and Development [OECD] (2018). *Programme for International Student Assessment*. <www.oecd.org/pisa/>.

16. O’Grady, Deussing, Scerbina, Fung, and Muhe (2016). *Measuring Up*.

The concerns regarding declining PISA scores for Alberta are heightened when the province is compared to both neighbouring British Columbia and the Canadian average based on the 2015 results.¹⁷ Figure 6 illustrates the PISA results for 2015 across all three test areas for Alberta, British Columbia, and the Canadian average. British Columbia and Alberta basically tie in reading and science but British Columbia outperforms Alberta on mathematics. Similarly, while Alberta is above the national average on both reading and science, it falls below the national average on mathematics.

Figure 6: PISA scores reading, science, and mathematics for British Columbia, Alberta, and Canada, 2015



Sources: O’Grady, Deussing, Scerbina, Fung, and Muhe, 2016, *Measuring Up*; OECD, 2018: various PISA reports.

The decline in mathematics scores is to some extent a pan-Canadian problem. Between 2003 and 2015, eight of the ten provinces experienced a statistically significant decline in math scores. However, the decline in Alberta’s scores was the second largest in Canada. Only Manitoba saw a larger decline.¹⁸

The province itself also administers two sets of tests for Alberta students. The first is the Provincial Achievement Tests (PAT), which are administered annually to students in grades 6 and 9. These tests are intended to “determine if students are learning what they are expected to learn” as well as to provide information to principals, school authorities,

17. For more information on Canada’s PISA results in 2015, see: O’Grady, Deussing, Scerbina, Fung, and Muhe (2016). *Measuring Up*.

18. John Richards (2017). *Red Flags for Educators: Lessons for Canada in the PISA Results*. Commentary No. 488. C.D. Howe Institute. <https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_488.pdf>.

and Albertans more broadly on the performance of the province's school system. The tests are applied across a range of subjects including English, French, mathematics, science, and social studies.¹⁹

The province also administers Grade 12 Diploma Exams across eight subject areas including biology, chemistry, English (2 levels), French (2 tests available), mathematics (2 levels), physics, science, and social studies (2 levels). The examinations are meant to “certify the level of individual student achievement in select grade 12 courses, to ensure that province-wide standards of achievement are maintained, [and] to report individual and group results”.²⁰

In the context of increasing per-student spending coupled with the observed decline in PISA test results presented earlier, there are some concerning trends that emerge from the latest PAT results. First, across all of the subjects broadly and taken together there has not been a general improvement in PAT results that would be commensurate with the increase in per-student spending. Second, the PAT results show a decline in mathematics that buttresses the observed declines in PISA scores for mathematics. Figure 7a and 7b show the results for the PAT for grade-9 mathematics. **Figure 7a**²¹ shows the share of students writing the grade-9 math exam whose results were “below acceptable standard”. Between 2013/14 and 2017/18, the latest year of available results, the share of students falling below the acceptable standard increased from 24.8% to 33.3%. In just the last year (2016/17–2017/18), the share of Alberta students failing to reach the “acceptable standard” increased from 24.5% to 33.3%, which represents an increase of 35.9%. It is also worth noting that the standard itself is only set at 42.0%, down from the previous standard of 44.0%.²²

Figure 7b shows the results for the other end of the performance spectrum: the share of students writing the exam that achieved a “standard of excellence”. The share of students achieving this level of performance has declined from 19.4% in 2013/14 to 16.9% in 2017/18.²³ Results from the grade-12 mathematics exam (30-1)²⁴ are more encouraging, although the inconsistency raises concerns. Specifically, the share of grade-12 students achieving an acceptable standard on mathematics 30-1 increased from 75.1% in 2013/14 to 77.8% in 2017/18. Similarly, the share of students achieving a standard of excellence on

19. Alberta Education (2018). *PAT Overview*. Provincial Achievement Tests. <<https://education.alberta.ca/provincial-achievement-tests/about-the-pats/?searchMode=3>>.

20. Alberta Education (2018). *About the Diploma Examinations Program*. Diploma Exam Administration. <<https://education.alberta.ca/diploma-exam-administration/diploma-examinations-program/>>.

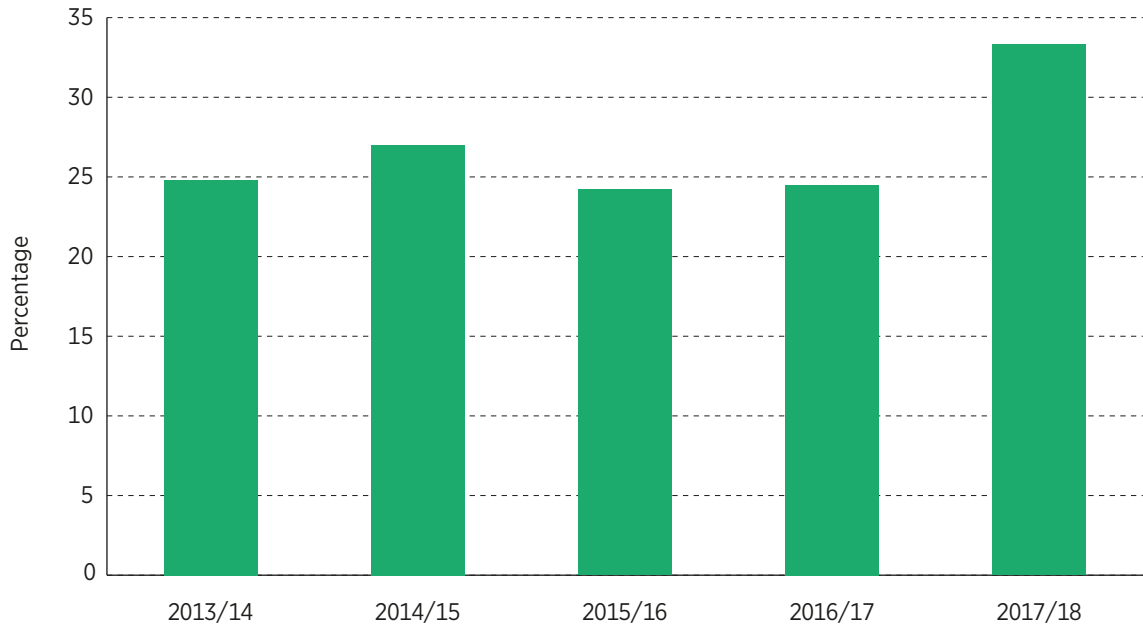
21. Alberta Education (2018). *Provincial Achievement Test Multiyear Reports*. <<https://education.alberta.ca/media/3772573/pat-multiyear-province-report-table.pdf>>.

22. Eva Ferguson (2018). “Shockingly Low Numbers”: Province Dropped Pass Score to 42% for Grade 9 Math Test. *Calgary Herald* (October 24). <<https://calgaryherald.com/news/local-news/shockingly-low-numbers-even-with-the-bar-set-low-40-of-grade-9-students-fail-math-in-cbe>>.

23. Alberta Education (2018). *Provincial Achievement Test Multiyear Reports*.

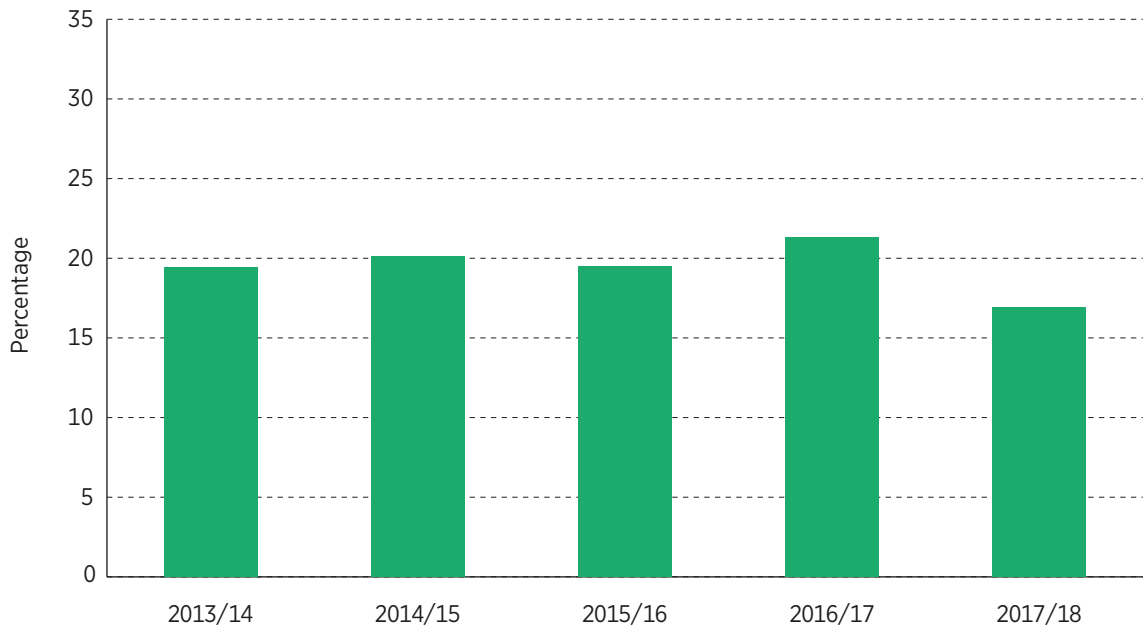
24. Math at the Grade 12 level is 30-1, the highest level academic math course taught in Alberta's high schools; this is the course required for admission to provincial university programs that involve a significant math component.

Figure 7a: Share (%) of students writing Mathematics 9 whose results were below acceptable standard, 2013/14–2017/18



Source: Alberta Education, 2018, *Provincial Achievement Test Multiyear Reports*.

Figure 7b: Share (%) of students writing Mathematics 9 whose results met the standard of excellence, 2013/14–2017/18



Source: Alberta Education, 2018, *Provincial Achievement Test Multiyear Reports*.

mathematics 30-1 increased from 27.9% in 2013/14 to 35.3% in 2017/18. However, the fact that grade-9 students are performing poorly on PAT exams should cause concern about how these students will perform on grade 12 diploma exams, particularly given the large increase in the number of students falling below the acceptable standard

What seems fairly clear from the data presented thus far is that Alberta's student performance on tests has not concurrently improved as per-student spending has increased. Indeed, in several areas, particularly with respect to mathematics, student performance has declined, which should raise serious concerns for parents, students, and policymakers.

In conclusion, the gap in per-student spending between Alberta and the national average, and particularly in comparison with British Columbia, does not seem connected with improved results either in absolute terms or when compared to results on international and provincially administered tests. In plain language, the increased spending without commensurate performance improvement should encourage the provincial government to seek reform options that can improve student outcomes, reduce expenditures (without compromising achievement), or perhaps both.

2 Improving Alberta’s Public School System

As discussed in section one, the overwhelming majority of Alberta students attend some type of government school, whether it’s a standard Anglophone government school, a Francophone government school, a Separate Catholic government school, or a charter school. In addition, a number of observers have noted the unusual degree of diversity of education provided within the government school system in Alberta compared to other jurisdictions. In 2014/15, the most recent year of comparable data, 94.1% of Alberta students were enrolled in a government school,²⁵ ranking Alberta sixth highest in the country even though it has one of the most generous systems to support parents who choose independent schools or home schooling.

Given that a large majority of Albertan students (as in all in all other provinces) attend government schools, it is critically important that these schools deliver high-quality education for students and their families. This section of the paper examines policy reforms within the government school system. Specifically, this section will consider three main reforms—incentive pay for teachers, expansion of charter schools, and open enrolment.

Teacher incentive pay²⁶

An innovative reform that holds the potential to improve student performance in Alberta is changing the compensation system for teachers. Currently teachers in Alberta are paid according to the number of years of post-secondary education attained and the number of years of teaching experience. There is no salary differentiation based on student performance outcomes or any other measure of teacher effectiveness. In other words, highly effective teachers are paid the same as average and even ineffective teachers so long as they have the same number of years of education and experience.

Education analyst Vicki E. Alger recently reviewed the research on incentive-based compensation for teachers as well as a number of successful incentive-pay programs in her 2014 study, *Teacher Incentive Pay that Works: A Global Survey of Programs that Improve Student Achievement*.²⁷ The ten successful programs reviewed in the analysis all improved student performance with only limited additional resources. In addition, the paper noted how pervasive performance compensation is in other sectors of the economy across many of the countries included in the analysis.

25. MacLeod and Hasan (2017). *Where Our Students Are Educated*: table 4.

26. Please note that, while this reform is presented in the section focused on the government school sector, it is nonetheless equally applicable to the independent school sector.

27. Vicki E. Alger (2014). *Teacher Incentive Pay that Works: A Global Survey of Programs that Improve Student Achievement*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/teacher-incentive-pay-that-works.pdf>>.

Some of the documented improvements in student performance in the case studies covered by the paper are quite promising. For example, teachers in Chile who were included in a nationwide program for incentive pay “produced verifiable improvements in students’ standardized language and math scores, up to 0.23 of a standard deviation in language and up to 0.25 of a standard deviation in math”.²⁸ During this period, Chile’s performance on PISA also improved. By 2012, Chile outperformed every Latin American country across all three test areas.²⁹

Similarly, the Little Rock School District in Arkansas experimented with an incentive-pay program for three years (2004/05–2005/07) and “student scores increased 0.16 of a standard deviation in math, 0.15 of a standard deviation in reading, and 0.22 of a standard deviation in language”.³⁰

The Performance-Related Pay (PRP) experiment in England during the early 2000s, which was a result of the education reforms in the late 1980s, led to some improvements. For instance, an early analysis of the program that looked at test results before and after the reform found that “overall student test scores increased by about one-half of a General Certificate of Secondary Education (GCSE) grade level per student, a significant 0.73 of a standard deviation”.³¹ It’s important to note, though, that observers of the PRP in England have concluded that it has evolved to a system of pay increases rather than incentive-based pay. However, the link between performance and pay increases (rather than bonuses or periodic incentive payments) seems to have resulted in student performance gains.

In her paper, Alger further documents successful performance-based incentive compensation experiments in India, Israel, Houston, Texas, and Nashville, Tennessee. The common observation was improvement in student performances linked with well-designed incentive-based compensation. Critically, she observed that these successful programs commonly included “design features and program elements in place to ensure student achievement gains are real, not the result of gaming the system through such practices as grade inflation or excluding struggling students”.³² This is one of the main and legitimate concerns raised regarding incentive-based compensation, that it simply creates incentives to game the compensation system without genuinely improving student performance.

Alger also concluded that successful programs had a number of common characteristics: (1) define expectations for teachers; (2) don’t confuse incentive pay for “cash for test scores”; (3) reward what is valued; (4) build programs to last; and (5) ensure schools embrace continuous improvement as a core value. The following section briefly explains each of these common characteristics, with particular attention to some of the mistakes observed in some experiments with incentive compensation.

28. Alger (2014). *Teacher Incentive Pay that Works*: 10.

29. Alger (2014). *Teacher Incentive Pay that Works*: 9.

30. Alger (2014). *Teacher Incentive Pay that Works*: 17.

31. Alger (2014). *Teacher Incentive Pay that Works*: 19.

32. Alger (2014). *Teacher Incentive Pay that Works*: 7.

As Alger noted, the performance expectations for teachers need to be clearly established and agreed upon. Alger warned that the goals must be outcome-based, and cautioned that “incentive programs that are ineffective at raising student achievement prioritize input- and process-based factors such as student or teacher attendance, perceptions about learning environments, degrees, class size, generalized professional development, and seniority”³³ rather than actual outputs such as improvement in standardized tests. In terms of defining outcomes, Alberta already conducts standardized tests in the form of the Provincial Achievement Tests in grades 6 and 9 as well as diploma exams that high-school students write in grade 12.

Improving test scores can be an important part of an incentive pay program but should not be the only focus. Testing should be understood in a broader context of measuring student learning. Implying that teachers will begin to merely “teach to the test” is a common criticism of standardized testing. However, Alger noted that students in schools that had successful incentive-pay experiments improved in both the incentivized and the non-incentivized subjects. Teachers who are incentivized and rewarded by improving their effectiveness see their students improve in multiple areas not just those covered by tests.

Similar to the need to establish clear expectations and goals, Alger found that a common trait among successful programs was that the stated goals were achievable and that the amount awarded teachers was significant enough to incentivize changes in behaviour by the teachers, whether it was extra effort, additional training, willingness to adopt new techniques and so on. Alger found that successful programs awarded teachers a bonus amount that equaled 90% or more of their average monthly salary. Her analysis also concluded that any program must be consistent—all teachers who meet their stated goals must receive their promised reward.

An unfortunate commonality amongst many of the incentive-pay programs that Alger reviewed is that they were implemented as experiments for several years and then abandoned despite their successes. Long term, stable funding is key to ongoing success. If the aim is to achieve long-term increases in student performance, then a long-term commitment to teacher incentive compensation is critical.

Finally, Alger concluded that an effective incentive pay program must also be combined with professional development and other supports for teachers. Principals and other education supervisors need to recognize that improvement takes time and teachers need to be given opportunities to learn and improve their skills. At the same time, incentive-pay programs should undergo regular evaluation and improvement in order to ensure that the programs are rewarding teachers in such a way that real improvement is achieved in student achievement.

Given the potential for real improvements in the performance of Alberta’s students and the relatively low costs observed in successful experiments with teacher incentive programs elsewhere, the province would be well served to at least begin experiments that could form the basis for larger scale reform of teacher compensation in the province.

33. Alger (2014). *Teacher Incentive Pay that Works*: 45.

Expanding charter schools

Alberta is unique in Canada in that it is the only province that allows charter schools. Charter schools inject greater choice for parents within the government system.³⁴ Charter schools in Alberta are “autonomous non-profit public schools that provide basic education in a different or enhanced way to improve student learning, attitudes and knowledge, meet the needs of a particular group of students through a specific program or teaching/learning approach, [and] follow Alberta Education’s Program of Studies”.³⁵ More specifically, while charter schools are independently operated and exempt from many of the inhibiting regulations that impede innovation in traditional government schools, they are nonetheless part of the government school system. They are not allowed to be affiliated with a particular religion and cannot charge tuition.

Legislation to allow charter schools was enacted in Alberta in 1994, and capped the number of charters at 15. There are currently 13 charter schools in the province that operate on a total of 22 campuses. The majority of these schools are located in Calgary and Edmonton with a few schools in smaller centres. Even though there are a relatively small number of charter schools in the province compared to other types of schools, they have experienced a significant growth in enrolment. Between 2000/01 and 2014/15, enrolment at charter schools increased from 2,558 students to 9,131, an increase of 257%. When measured as a share of total enrolment, charter schools have increased from 0.4% to 1.4% over the same period.³⁶ Several charter schools have reported extensive wait lists, demonstrating that they are highly sought after by parents.³⁷

Beyond the independence offered by charter schools, many parents seem to be motivated by their ability to improve student performance. For instance, a recent comprehensive analysis of charter schools in Alberta³⁸ found that they tended to out-perform all other types of schools in Alberta as measured by performance on grades 6 and 9 Provincial Achievement Tests (PATs). This is particularly impressive given that there are several charter schools that cater to students who have exceptional needs, such as English language learners or at-risk youth. Indeed, a recent review of charter schools in the United States and Canada concluded that charter schools were particularly effective

34. For a succinct discussion of the broad benefits of school choice and competition within the public system, please see: Cassandra M.D. Hart and David Figlio (2011). Does Competition Improve Public Schools? New Evidence from the Florida Tax-Credit Scholarship program. *Education Next* 11 (Winter), 1. <<https://www.educationnext.org/does-competition-improve-public-schools/>>. For a discussion of both the benefits and how to achieve more choice and competition within a government school system, see: Derek J. Allison (2015). *Expanding Choice in Ontario’s Public Schools*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/expanding-choice-in-ontarios-public-schools.pdf>>.

35. Alberta Education (2016). *Charter Schools in Alberta*. Charter Schools. <<https://education.alberta.ca/charter-schools/about-alberta-charter-schools/>>.

36. MacLeod and Hasan (2017). *Where Our Students Are Educated*.

37. For example, in 2015 *CBC News* reported that there were 11,000 children on the wait list for Foundations for the Future Charter Academy and quoted Judy Gray, co-president of the Association of Alberta Public Charter Schools, saying that most other charter schools also had wait lists. *CBC News* (2015). Charter Schools in Alberta See Spike in Demand. <<https://www.cbc.ca/news/canada/calgary/alberta-charter-schools-popular-demand-1.3260151>>.

38. MacPherson (2018). *An Untapped Potential for Educational Diversity*.

at improving student performance for students in “underserved” groups at traditional government schools, including students from poorer communities, ethnic minorities, and those entering school with lower educational levels.³⁹

One of the reasons more charter schools have not been opened, and indeed the province has not reached its cap, is the approval process. For a group to gain approval for a new charter school, it must first approach the local school board, which has an opportunity to establish an alternative program instead. The conflicting incentives in this are abundantly clear. The board may decide that there is a similar program already offered in which case the application will be declined.

If an application is rejected, applicants can appeal directly to the Minister of Education to obtain authorization for a new charter. Neither the Ministry of Education nor the Association of Alberta Public Charter Schools maintain a record of how many charter school applications have been denied but in 2016 the Minister of Education, David Eggen, rejected the applications for two new charter schools. Mr. Eggen rejected the applications, one for a school geared towards students with learning disabilities and the other for a school that would focus on Spanish and science, because he “concluded that these proposals did not significantly differ from what is currently offered by Calgary’s school boards”.⁴⁰ Notably, there have been no charters approved in the last decade.⁴¹

The ability of charter schools to expand parental educational choice, increase school competition, and improve student performance, particularly for many at-risk student groups means that the province should examine potential reforms to improve the regulations and environment for charter schools.⁴² Four policy reforms are presented that would facilitate more charter schools in the province.

First, the requirement that new charter schools can only be established if the proposed program “is not already being offered” by the school boards in the area should be eliminated.⁴³ There are three primary problems with the current requirement. One, there is an obvious conflict in terms of a local school board being in the position to determine need and uniqueness given their incentives to retain students in their school system. Two, determining whether or not a similar program is being offered is open to a significant amount of interpretation and discretion, which exacerbates the conflict noted in the first problem. And finally, even if there is a similar program being offered by the school board, it does not necessarily mean it is accessible for all interested students and parents, particularly given observed wait lists for many charter schools. If there is enough parental support to open a charter school, the fact that a similar program is offered by the school board should not be sufficient to reject the application.

39. Bosetti, Brown, Hasan, and Van Pelt (2015). *A Primer on Charter Schools*: iv.

40. *CBC News* (2016). Alberta Education Rejects Proposed ReThink Charter Academy and West Calgary Spanish Science School. <<https://www.cbc.ca/news/canada/calgary/alberta-education-rejects-rethink-charter-academy-west-calgary-spanish-science-school-1.3429941>>.

41. The most recently approved charter school was Valhalla Community School, whose charter was granted in 2008.

42. For a succinct discussion of the benefits of competition in the public school system, see: Hart and Figlio (2011). *Does Competition Improve Public Schools?*

43. Province of Alberta (2018). *School Act*. Revised Statutes of Alberta 2000. Chapter S-3. Current as of September 1, 2018. <<http://www.qp.alberta.ca/documents/acts/s03.pdf>>: 32 (c).

Two, approaching a school board with a new request is an unnecessarily burdensome requirement for a new charter application. If the requirement that all new charter schools must offer a unique program is removed, there is no need for school boards to have the option to offer an alternative program themselves before a charter application can proceed. All applications for new charters should go directly to the Ministry of Education. What's more, a clear set of objective criteria should be established for the approval of new charters, so that automatic approval is granted when all of the criteria are met. The approval of a charter should not be left up to the opinions and whims of the Minister of Education but instead be based on a transparent set of guidelines.

Third, given the changes outlined in recommendations one and two, it is entirely feasible that the current cap of 15 charter schools could be reached rather quickly. There is no need, however, to impose an artificial maximum on the number of charter schools, which should be determined by parental demand and their ability to secure facilities.

Finally, a mechanism should be put in place to allow public schools operated by school boards to convert to charter schools. In the United States, 44 of the 50 states (as well as the District of Columbia) currently allow charter schools. Of these, 39 (plus the District of Columbia) allow public schools to convert to charter schools.⁴⁴ The exact process varies by state; however, the support of the majority of parents and teachers of the school is frequently required.

The four reforms suggested above would facilitate the growth of charter schools in Alberta, assuming parents demand this type of education. It would also inject more competition within the public school system as well as the broader K-12 education system.

Open enrolment

Most types of public schools (Anglophone, Francophone, and Catholic) have a designated attendance area. This means that any students who live in the attendance area are guaranteed enrolment at the school in the area. Attendance areas for different schools, and different specialized programs, often overlap such that (depending on their geographical location) a family could reside within the attendance area of several types of schools.

However, families in Alberta have the option to request that their child attend a school that is located outside of their area. The Education Act states that schools are to register a student that lives outside of the attendance area of the school, or the attendance area of the school board, as long as “in the opinion of the board asked to enrol the student, there are sufficient resources and facilities available to accommodate the student.”⁴⁵ However, students who reside within the attendance area must always be given priority.⁴⁶ In theory, the rules now in place in Alberta generally provide students and their families with access to schools outside of their attendance area. However, there are reforms that could further strengthen the ability of parents to send their children to preferred schools outside of their attendance area.

44. Education Commission of the States (2018). *Charter Schools: Does the State Allow Existing Public Schools to Convert to Charter Schools?* <<http://ecs.force.com/mbdata/mbquestNB2C?rep=CS1702>>.

45. Province of Alberta (2017). *Education Act. Statutes of Alberta, 2012*. Chapter E-0.3. Current as of August 4, 2017. <http://www.qp.alberta.ca/1266.cfm?page=e00p3.cfm&leg_type=Acts&isbncln=9780779786855>: 10 (2), (4).

46. Province of Alberta (2017). *Education Act*: 10 (3).

Before delving into specific reforms, it is worth examining British Columbia's approach to catchment areas. A recent study by Jane Friesen, Benjamin Harris, and Simon Woodcock, *Expanding School Choice through Open Enrolment: Lessons from British Columbia*, analyzed the effect of open enrolment policies in British Columbia.⁴⁷ In 2002, British Columbia implemented open enrolment throughout the province, which gave parents more freedom to opt out of their neighbourhood school in two ways. Prior to the reform, parents had to first seek permission from the principal of the school where their child was supposed to attend based on geography before they could request that their child be enrolled in an out-of-catchment school. Second, principals of the preferred school had the discretion to reject out-of-catchment requests even if they had space to accommodate the new student. The reforms enacted eliminated both the need to ask permission from the local principal and the discretion of the principal at the potential receiving school so long as space was deemed available.

Empirical evidence analyzed by Friesen and her colleagues indicates that academic performance has improved since open enrolment was introduced. The study analyzes the Foundation Skills Assessment (FSA) scores of grade 4 students in the province's Lower Mainland and found that, for a student scoring at the 50th percentile in an average neighbourhood, open enrolment led to a 1.2 point increase and a 1.0 point increase in percentile ranking for reading and numeracy scores, respectively. Amongst those residing in high-density neighbourhoods, open enrolment contributed to a 3.0 percentile point increase in reading and a 2.4 percentile point increase in numeracy scores.⁴⁸ More importantly, the increase in test scores was predominantly a product of increased school competition rather than a portion of students having access to better schools. The higher positive impact for students in densely populated areas is suggestive that in order for the policy to be effective, realistic alternatives must exist in a reasonable geographic boundary.

While Alberta already maintains open enrolment policies, it is important to both reiterate the importance of such a policy as well as to evaluate whether improvements can be made. For instance, clearer guidelines in regards to when an out-of-area student must be accepted into a particular school would clearly improve upon the current guidelines which refer this to the discretion of the "opinion of the board".⁴⁹ If more specific guidelines were established, parents would have a clearer understanding of their options while simultaneously reducing the discretionary authority of education bureaucrats. The aim of such clarification should be how best to balance empowering Alberta families with more education choice while acknowledging the constraints of the schools those parents would prefer their children to attend.

This section has detailed a number of reforms to improve the performance of public schools while enhancing educational choice including performance-based incentive pay for teachers, expanding charter schools, and ensuring open boundaries for enrolment.

47. Jane Friesen, Benjamin Cerf Harris, and Simon D. Woodcock (2015). *Expanding School Choice through Open Enrolment: Lessons from British Columbia*. Commentary No. 418. C.D. Howe Institute. <https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_418.pdf>.

48. Friesen, Harris, and Woodcock (2015). *Expanding School Choice through Open Enrolment*.

49. Province of Alberta (2017). *Education Act*: 10 (2), (4).

3 Unleashing Innovation in Independent Schools

The previous section explored reforms that could improve education within the government or public system. The remaining students are enrolled in independent schools or educated at home. This section focuses on possible reforms to improve education in the independent school sector, which in 2014/15 had 29,400 students, representing 4.4% of all enrolment.⁵⁰ Independent schools exist wholly outside of the public system. They are privately owned by non-profit organizations or charities. Often times they have a particular educational focus such as alternative pedagogies (Montessori and Waldorf), religion, or academic orientation (STEM, for instance) that are not readily provided by the public system.

Critically, Alberta is one of five Canadian provinces that provide financial support to parents choosing independent schools rather than a public school or home schooling. Accredited independent schools receive grants amounting to 60% or 70% of the per-pupil operating funding allocated to public schools in the comparable region, which reduces the costs directly borne by the parents.⁵¹ Despite having the second-highest grant levels, Alberta ranked fifth in the level of independent school enrolment in the latest data, behind British Columbia, Quebec, Manitoba, and perhaps, most interesting of all, Ontario, which does not provide any assistance to parents choosing independent schools.

Before exploring policy reforms that could enhance education and the accessibility of the independent school sector, it is first important to dispel a commonly held misperception about independent schools in Alberta, and indeed most of Canada. There is an often held view that independent schools cater to the ultra-wealthy.⁵² A recent study provides two insights that effectively refute this assumption about the nature of families choosing independent schools.⁵³ First, the analysis examined the share of independent schools in the province that could reasonably be defined as “elite” based on the tuition charged compared to average after-tax family income.⁵⁴ Specifically, the analysis defined any independent school in the province as elite that charged more than 10% of the average

50. MacLeod and Hasan (2017). *Where Our Students Are Educated*.

51. Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

52. For example, Progress Alberta has often argued against public funding of independent schools on the grounds that they cater to the ultra-wealthy and elite in the province. See, for instance: Progress Alberta (2017). *Say Hello to the Most Elite Private School in Alberta: Strathcona-Tweedsmuir School*. <http://www.progressalberta.ca/most_elite_private_school_in_alberta>.

53. Angela MacLeod, Sasha Parvani, and Joel Emes (2017). *Comparing the Family Income of Students in Alberta's Independent and Public Schools*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/comparing-the-family-income-of-students-in-albertas-independent-and-public-schools.pdf>>.

54. This tuition-to-average after-tax income approach is different from that of Allison, Hasan, and Van Pelt (2016) that relied on accreditations to classify “elite” schools; specifically Canadian Accredited Independent Schools (CAIS) or the Independent Schools Association of British Columbia (ISABC) was used as a proxy for identifying elite schools.

after-tax family income⁵⁵ in Alberta, or \$11,190.⁵⁶ MacLeod, Parvani, and Emes concluded that only 17.7% of independent schools in Alberta could be classified as elite based on the tuition-to-average after-tax income ratio.⁵⁷

The second insight from this analysis refuting the claim that only wealthy families choose independent schools is based on a comparison of average after-tax family income. The average after-tax income for families with children enrolled in non-elite⁵⁸ independent schools was \$95,549, which is 1.8% less than the average income for families with children attending government schools (\$97,301) in the province.⁵⁹ In other words, the after-tax family income for families in Alberta choosing government schools is essentially the same as those families who choose to have their children attend a non-elite independent school.

This section now turns to several potential reforms that should be considered for improving the independent school system in Alberta, and indeed the broader educational system.

Variable vouchers—an innovation from Australia

Independent schools in Alberta receiving government grants are eligible for either 60% or 70% of per-pupil funding in comparable government schools. The determination of whether the grant is 60% or 70% is based on whether the school agrees to operate under the province's accountability program.⁶⁰ Put differently, the variation in the value of the voucher in Alberta is not related whatsoever to the income of the parents choosing the independent school.

The closest any province in Canada that provides funding to independent schools comes to varying the value of the government grant provided to the independent school based on income occurs in British Columbia, which is a crude approximation at best. British Columbia reduces the value of the government grant from 50% to 35% when the per-student

55. Statistics Canada (2017). Custom tabulation from *2011 National Household Survey: Census Families in Private Households by Presence and Age of Children, by Census Family Structure, and by Selected Characteristics*.

56. Although there is no objective measure to identify elite schools, the authors agreed that the classification should be based on income and accessibility. Previous studies on child care and energy poverty gravitate towards a 10% rule. For example, a City of Toronto study on child care classifies fees of less than 10% of net family income as affordable and fees above 10% as unaffordable. Similarly, in energy poverty literature, it is a generally accepted convention that households spending 10% or more of their incomes on energy services are considered to be fuel poor. For further discussion of these two areas of research, see G. Cleveland, M. Krashinsky, S. Colley, and C. Avery-Nunez (2016). *Technical Report: City of Toronto Licensed Child Care Demand and Affordability Project*. Self-published. <https://www.researchgate.net/profile/Gordon_Cleveland/publication/309119751_City_of_Toronto_Licensed_Child_Care_Demand_and_Affordability_Study/links/57ffa1b08ae6fc7fc65182c/City-of-Toronto-Licensed-Child-Care-Demand-andAffordability-Study.pdf>; B. Boardman (1991). *Fuel Poverty: From Cold Homes to Affordable Warmth*. Belhaven Press; Jonathan A. Lesser (2015). *Less Carbon, Higher Prices: How California's Climate Policies Affect Lower-Income Residents*. Manhattan Institute.

57. MacLeod, Parvani, and Emes (2017). *Comparing the Family Income of Students in Alberta's ...*

58. Families with children in elite independent schools earned an average after-tax income of \$192,265, which is 97.6% higher than the average income for families with children in public schools. See MacLeod, Parvani, and Emes (2017). *Comparing the Family Income of Students in Alberta's ...*

59. MacLeod, Parvani, and Emes (2017). *Comparing the Family Income of Students in Alberta's ...*

60. Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

spending by the independent school exceeds the average of comparable government schools in the district.⁶¹ The underlying assumption is that these schools cater to a higher-income, wealthier group of families. This makeshift approach totally ignores the specific incomes of families attending the independent schools. In other words, it treats families with income in the top 10% of families in the province the same as families in the bottom 10%.

An innovation in Australia for varying the value of the government grant for independent schools is worth noting and perhaps even extending to ensure that independent school education is available to families at all income levels. Before delving into the specific reform in Australia, it is important to understand several characteristics of Australia's education system. First, in 2014, the share of students enrolled in independent schools in Australia was more than five times that of Canada: 34.9% compared to 6.8%.⁶² Recall that 4.4% of students in Alberta are enrolled in an independent school. Put simply, Australia has a much larger independent school sector than Canada and Alberta.

Part of the explanation for the size of Australia's independent school sector is that, like all Canadian provinces except for Ontario, Saskatchewan, and Alberta, religious education and in particular Catholic education is delivered exclusively by independent schools. Indeed, of the 34.9% of students attending independent schools in Australia, 20.5% attend independent Catholic schools and the remaining 14.4% attend other independent schools.⁶³ In 2013, the year before the reform in question was implemented, the average operating grant provided to an independent school in Australia was \$8,781, which represents 56.1% of the average operating grant provided to government schools in Australia (in Canadian dollars using Bank of Canada conversions of Australian dollars).⁶⁴ Recall that the government grants in Alberta range between 60% and 70%.

The innovation in grants provided to independent schools in Australia by governments is that they are adjusted based on the socioeconomic status of individual students. Specifically, the value of the government grant to the independent school is adjusted based on the socioeconomic profile of the area in which each student in a school resides. As a recent study on this issue by Australian education expert Kevin Donnelly noted: "Specifically, government funding for students from the highest socioeconomic status (SES) areas is limited to 20%, while grants for students from the lowest SES areas can reach 90%. The remaining portion of the tuition costs must be covered by the parents or through fundraising by the school".⁶⁵

Put simply, the Australian innovation is to vary the value of the government funding to independent schools to reflect the assumed economic ability of the family to afford private tuition costs based on their residential location. One of the obvious drawbacks to this approach is that it can conceptually penalize comparatively lower-income families

61. Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

62. Kevin Donnelly (2017). *Regulation and Funding of Independent Schools: Lessons from Australia*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/regulation-and-funding-of-independent-schools-lessons-from-australia.pdf>>.

63. Donnelly (2017). *Regulation and Funding of Independent Schools*.

64. Donnelly (2017). *Regulation and Funding of Independent Schools*.

65. Donnelly (2017). *Regulation and Funding of Independent Schools*: iii.

who might reside in marginally higher socioeconomic neighbourhoods while at the same time benefiting higher-middle or even higher-income families who may not live in a neighbourhood that accurately reflects their income.

The intent of the variation in the value of the government grant is, however, worth noting given that it is an attempt to make independent school education more affordable and thus accessible for lower-income families. Specifically, building on the Australian innovation of varying government grants based on the socioeconomic profile of the communities students reside in, Alberta could introduce higher levels of government grants for lower-income families in order to improve their ability to send their children to independent schools. The government grants could range from the current 70% to the 90% level used in Australia for families whose annual after-tax income falls below a prescribed threshold.⁶⁶ The potential for such a policy is to make accessible schools that are currently out of reach for lower-income Alberta families.

Include for-profit schools—a lesson from Sweden

Sweden embarked on a series of fundamental reforms of its educational system in the early 1990s.⁶⁷ These offer some insights for potential reforms in Alberta and indeed Canada's larger independent school sector. The reforms in Sweden have seen large-scale increases in enrolment in independent schools. Specifically, the share of students in Sweden enrolled in independent schools has risen from less than 2% in 1992 when reforms began to 14.1% for primary and lower secondary grades and to 25.1% for upper secondary grades (as of 2014).⁶⁸

There are two reforms from the Swedish experience to consider, described like this by Swedish education expert Gabriel Heller Sahlgren:

[D]uring this period education in Sweden was fundamentally transformed from one of the most centralized education systems in the OECD to one of the most decentralized. Funding was decentralized from the national to the municipal level, public school choice opportunities increased, and a national voucher system allowed for-profit and non-profit independent elementary and secondary schools to receive funding equivalent to 100 percent of the per-student allocation for average operating costs⁶⁹ at local municipal schools.⁷⁰

66. If this reform were implemented, the government would be advised to consider a gradual reduction in per-student grants from 90% to 70% as income rises rather than using a single cut-off point in order to prevent unwanted labour incentives from a sharp decline in benefits at a specific income level.

67. For an overview of the Swedish reforms and some of the early results, please see: Claudia Rebanks Hepburn (1999). *The Case for School Choice: Models from the United States, New Zealand, Denmark, and Sweden*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/CaseforSchoolChoice.pdf>>.

68. Gabriel Heller Sahlgren (2016). *Regulation and Funding of Independent Schools: Lessons from Sweden*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/regulation-and-funding-of-independent-schools-lessons-from-sweden.pdf>>.

69. It is important to note that independent schools in Sweden still do not receive capital or maintenance-related grants. The parity of funding is, therefore, limited to operating expenses.

70. Sahlgren (2016). *Regulation and Funding of Independent Schools*: iii.

As discussed previously with respect to the Australian innovation, there is some merit in considering increasing the value of government grants to mitigate the financial burden of attending independent schools for lower-income families. The merit linked with making independent schools more accessible for families with limited resources loses a great deal of its value when the same higher government grants are provided to families of means.

The more meaningful lesson for Alberta and perhaps the more interesting innovation in Sweden is that for-profit schools are also eligible for government grants. While for-profit schools are permitted in Canada, none of the five provinces that provide government grants to independent schools allow for-profit schools to be eligible for such grants.⁷¹ On this policy, the Swedish experience is quite informative:

[T]he most significant independent school enrolment growth occurred in the for-profit sector. In all, 64 percent of elementary and lower-secondary independent school students and 85 percent of upper-secondary independent school students attend for-profit schools. Thus, not only do independent schools in Sweden attract one in seven lower-grade students and one in four upper-secondary students in the country, but the vast majority of those students attend for-profit institutions.⁷²

A reform in Alberta permitting for-profit independent schools to be eligible for government grants would likely expand the supply of independent schools and the diversity of options available to parents. In addition, for-profit schools have access to capital and financing that non-profit and charitable independent schools simply lack. Indeed, one of the insights from the Swedish experience is the role chain schools can play in the independent school sector. In 2015, the ten largest chains of for-profit independent schools in Sweden enrolled 36% of all independent school students.⁷³ Extending eligibility for government grants to for-profits in Alberta is another reform worthy of consideration based on the experience of Sweden.

Competitive and alternative curricula

While the term “curriculum” technically means the courses taught at any particular educational institution, it has in common usage evolved to mean something much broader. Indeed, in the Canadian context the term “curriculum” often refers to the lessons and academic content taught in a school or other educational institution. In other words, curriculum refers to what and how materials are taught to students. Currently, independent schools in Alberta must follow the provincial programs of study in order to be eligible for government grants.⁷⁴

A hallmark insight from economics is that monopolies impose costs on consumers; in the case of education, we would expect monopoly costs to be imposed on both parents

71. Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

72. Sahlgren (2016). *Regulation and Funding of Independent Schools*: iii.

73. Sahlgren (2016). *Regulation and Funding of Independent Schools*: iii.

74. Van Pelt, Hasan, and Allison (2017). *The Funding and Regulation of Independent Schools in Canada*.

and students.⁷⁵ More specifically, monopolies result in higher prices, lower quality goods and services, and/or less diversity in choice with respect to the good or service provided by a monopoly. There is no conceptual or theoretical reason to believe that these standard monopoly costs would not apply to education, as well as curricula more specifically.

When any province including Alberta imposes a curriculum on all government schools as well as independent schools receiving funding, it eliminates diversity of learning and the experimentation with different approaches that can lead to better methods. Perhaps worse—as is the case with changes in mathematics instruction—it requires that all covered educational institutions make the changes deemed beneficial by a centralized bureaucracy. Put differently, a mandated monopoly curriculum means that almost all students and their parents will incur costs if curriculum changes by the government are not successful and worse, as appears to be the case with mathematics, they result in worse outcomes.

It is important to note that alternative curricula—but with similar or even common learning outcomes—already exist in Canada. For instance, there are independent schools in many provinces including Alberta that choose to opt-out of eligibility for government funding in order to avoid having to follow a provincially imposed curriculum. For example, there are curricula rooted in traditional approaches, educational essentialism, progressive or inquiry-based, liberal arts, international baccalaureate programs, Montessori, Waldorf, and Reggio Emilia.⁷⁶ In other words, there are a multitude of different types of content and approaches generally aimed at achieving a common end with respect to learning outcomes. Allowing one approach to essentially monopolize much of the province makes little sense. The province should consider a transition to focusing on specifying learning outcomes and providing both the government system and certainly the independent schools more flexibility in how best to achieve the stated learning outcomes.

In addition, and quite critically given the province’s declining performance in mathematics, it is worth noting changes introduced in the province to the math curriculum. While the Ministry of Education is adamant that it is not imposing “discovery math” on Alberta students, going so far in 2015 as to issue a bulletin⁷⁷ to teachers helping them to explain this to parents, both the language used in the curriculum requirements as well as the general approach parallel the content of “discovery math”. For example, the themes of “mental math”, “learning various strategies”, and “understanding context” as well as the broader issue of first presenting problems and then exploring possible solutions are all dominant themes of “discovery math”.⁷⁸ In addition, a number of

75. For a succinct discussion of the concept of monopoly, please see George J. Stigler (2002). Monopoly. In David R. Henderson (Ed.), *Concise Encyclopedia of Economics* (Liberty Fund). <<http://www.econlib.org/library/Enc1/Monopoly.html>>.

76. For an excellent overview of these different curricula, please see Our Kids (n.d.). *Factors in Finding the Right School: Curriculum*. <<http://www.ourkids.net/school/private-school-curriculum>>.

77. Alberta, Ministry of Education (2015). *Bulletin for Teachers: Helping Parents Understand the Alberta Mathematics Kindergarten to Grade 9 Program of Studies*. <https://education.alberta.ca/media/481796/teacher_bulletin.pdf>.

78. For information on the content and aims of kindergarten to grade-9 mathematics in Alberta, please see: Alberta, Ministry of Education (2016). *Mathematics Kindergarten to Grade 9*. <https://education.alberta.ca/media/3115252/2016_k_to_9_math_pos.pdf>; and Alberta, Ministry of Education (2016). *Summary of*

commentators in the province who have investigated the decline in math performance of the province's students have criticized the provincial government for introducing "discovery math".⁷⁹

A number of scholars have suggested a link between the proliferation of curricula based on discovery math and the decline in math performance that has occurred across Canada in recent years as described in a preceding section.⁸⁰ University of Winnipeg associate professor of mathematics and statistics, Anna Stokke, for instance, has been particularly critical of the current fad in teaching mathematics, which is referred to as "discovery-based instruction".⁸¹ Her concerns regarding the new "discovery" approach is that it sets aside proven past techniques such as "times table memorization, explicit teacher instruction, pencil-and-paper practice, and mastery of standard mathematical procedures." Professor Stokke also points to the absence of international evidence indicating this new approach is more effective than the traditional system it replaced.⁸²

The point for consideration is broader than just the efficacy of adopting a new method of mathematics instruction, though clearly the provincial government should be undertaking an immediate and thorough review of curriculum changes in Alberta. More broadly though, this example illustrates how the imposition of monopoly curriculum regulations on all government schools and independent schools receiving government grants may contribute to sudden province-wide undesirable outcomes such as the recent observed decline in math scores.

Alberta's students and parents would be much better served if the province relaxed these regulations and allowed for more experimentation with respect to curriculum while still focusing on common learning outcomes. Freeing up both government and independent schools to experiment with different content and approaches to common learning outcomes offers the dual benefit of better matching parental preferences with educational options as well as the learning from experimentation.

Clarifications to the Alberta Mathematics Kindergarten to Grade 9 Program of Studies. <https://education.alberta.ca/media/3115246/2016_sum_of_clar_to_k_to_9_math_pos.pdf>.

79. See for example David Staples (2017). Math Results Show We Must End Two Decades of Educational Malpractice. *Edmonton Journal* (June 15). <<https://edmontonjournal.com/news/politics/david-staples-math-results-show-we-must-end-two-decades-of-educational-malpractice>>; Calgary Herald Editorial Board (2017). Something Doesn't Add Up with Alberta's Math. *Calgary Herald* (June 17). <<https://calgaryherald.com/opinion/editorials/something-doesnt-add-up-with-albertas-math>>; and Robyn Urback (2017). Just Fix the Bloody Math Curriculum. *CBC online* (September 1). <<https://www.cbc.ca/news/opinion/math-eqao-scores-1.4270882>>.

80. See, for instance: Richards (2017). *Red Flags for Educators*; Anna Stokke (2015). *What to Do about Canada's Declining Math Scores*. Commentary No. 427. C.D. Howe Institute. <https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/commentary_427.pdf>; and Michael Zwaagstra (2011). *Math Instruction That Makes Sense*. Policy Series No. 120. Frontier Centre for Public Policy. <https://fcpp.org/files/1/PS120_MathInstruct_SP15F1.pdf>.

81. For an excellent overview of discovery math as well as a comparison with traditional approaches to teaching math, please see: Our Kids (n.d.). *Approaches to Math Education: Traditional versus Discovery Math Education Models at Canadian Private Schools*. <<http://www.ourkids.net/school/math-education>>; and Our Kids (n.d.). *The Problem with Discovery-Based Math: What You Can Do to Help Your Child Become a Better Math Student*. <<http://www.ourkids.net/blog/the-problem-with-discovery-based-math-15971>>.

82. Stokke (2015). *What to Do about Canada's Declining Math Scores*: 1.

This section has offered three broad reforms for the independent school sector of Alberta, including varying the value of government grants to increase accessibility for lower-income families, including for-profit independent schools as eligible for government grants, and eliminating or at least easing the monopolization of curriculum based on common learning outcomes. In addition, given the declining performance in mathematics, an immediate and thorough review of curriculum changes should be undertaken within the context of a more flexible and innovative approach to curriculum regulation. These reforms would benefit not only the independent school sector and the families that currently or in the future would choose such schools but also the broader K-12 education system in the province.

4 Lessons from British Columbia

There has been much discussion comparing Alberta with British Columbia throughout this paper. A key reason is that British Columbia enjoys one of the lowest levels of per-student spending but some of the best results in terms of performance and education outcomes. Recall that Alberta spends 16.9% more per student in government schools than British Columbia (figure 4) but British Columbia's performance on international tests are the same or better than Alberta (figure 6). There are, therefore, worthwhile lessons for Alberta to consider in British Columbia's approach. At the very least, the comparison of British Columbia with Alberta offers insights into the real potential for reform that could reduce (or perhaps stabilize) spending while achieving better results.

As discussed briefly, British Columbia has the highest rate of independent school enrolment in the country (figure 2). Part of the reason for the comparatively high rate within Canada is that much of the choice for parents in British Columbia is provided by independent schools, whether in terms of religious education, alternative pedagogies, or specialized/focused education programs such as schools dedicated to STEM. In other words, the government system in British Columbia is fairly homogenous with much of the diversity and choice provided by the independent school sector. This is markedly different from Alberta's approach, which relies on government schools to deliver a significant degree of school choice in terms of religion (recall Alberta is one of three provinces with a public Catholic education system and that it offers additional religious education within the government school system), alternative pedagogies, focused programs, and charter schools.

This section applies the BC model of education to Alberta to estimate the potential savings available from fundamentally changing the delivery mix of K-12 education in the province. The analysis is based on a similar estimate completed for Ontario in 2014.⁸³ **Table 1**⁸⁴ shows the breakdown of student enrolment in Alberta for 2017/18.⁸⁵

The first step in the analysis is breaking down the enrolment of students in Alberta by the type of school with particular emphasis on the religious schools. The methodology employed in the Ontario study, upon which this is based, relied solely on the analysis of religious schools to estimate the potential savings. The reason for this approach was data

83. Deani A. Neven Van Pelt, Milagros Palacios, and Taylor Jackson (2014). *Financial Savings: Restructuring Education in Ontario Using the British Columbia Model*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/financial-savings-restructuring-education-in-ontario-using-the-british-columbia-model.pdf>>. Please note, however, that there is a major difference when applying the BC model to Ontario, which currently provides no support to parents choosing independent schools.

84. Source: Alberta Education (2018). *2017/18 Authority Enrolment Data*. <<https://education.alberta.ca/alberta-education/student-population/everyone/school-authority-enrolment-data/?searchMode=3>>.

85. Please note that these figures will differ from those presented in other figures since the latest available and comparable data among provinces is for 2014/15. This section relies on more up-to-date numbers for Alberta only provided by the Ministry of Education.

Table 1: Alberta elementary and secondary school enrolment, 2017/18

	Enrolment	Share of total
Total	708,115	
Public, standard	483,486	68.3%
<i>Public, religious</i>	14,032	2.0%
Public, religious, Christian	12,181	1.7%
Public, religious, Islamic	1,724	0.2%
Public, religious, Jewish	127	0.0%
Separate	168,629	23.8%
Other	56,000	7.9%
<i>Charter</i>	9,529	1.3%
<i>Francophone</i>	8,403	1.2%
<i>Private</i>	36,767	5.2%
<i>Provincial</i>	1,301	0.2%
Public (current)	671,348	94.8%
Private (current)	36,767	5.2%

Source: Alberta Education, 2018, *2017/18 Authority Enrolment Data*.

limitations regarding enrolment at other schools such as alternative pedagogy and specialized/focused programs that could also be transitioned from the government system to the independent school sector.

As indicated in table 1, there were a total of 168,629 K-12 students attending a Catholic school in 2017/18, representing 23.8% of total enrolment in the province. In addition to the schools operated by the separate Catholic boards, there were also 39 religious schools (as at the 2015/16 school year) that were operated by public school boards. The majority of these schools were Christian (non-Catholic) but there were also three Islamic schools, and one Jewish school. In 2017/18, there were 14,032 students attending these types of religious schools operated by public boards, representing 2.0% of total enrolment (table 1).

The source of potential savings comes from the basic difference between per-student government grants for government schools (100%) compared to independent schools, which is either 60% or 70% of the value of the government grant for government schools. Put differently, almost all independent schools charge some tuition,⁸⁶ which is the out-of-pocket cost of attending an independent school. In addition, unlike government

86. In the study, *Comparing the Family Income of Students in Alberta's Independent and Public Schools* (Angela MacLeod, Sasha Parvani, and Joel Emes, 2017), the authors catalogued the tuition of 96 independent schools in Alberta through a survey of the schools' websites and, in some cases, contacting the schools directly. Schools were then categorized as "elite" or "non-elite". Elite schools were defined as having annual tuition that exceeded 10% of the average after-tax family income in Alberta in 2015 (the latest year available). Based on this definition, only 17 of the 96 independent schools included in the analysis could be classified as elite, with the remaining 79 schools classified as non-elite.

schools, independent schools are required to finance their own capital expenditures. The transition of students from the government system to the independent school sector will, therefore, save the province ongoing per-student spending as well as capital grants in the future.

The relatively straightforward part of the calculation is the per-student savings when a student transitions from the government sector to the independent school sector. Government school funding is taken from data detailed in two studies, *Education Spending and Public Student Enrolment in Canada, 2017* and *Understanding the Increases in Education Spending in Public Schools, 2017*,⁸⁷ calculated as \$12,611⁸⁸ per student. This data set includes several categories of spending on government schools that are often overlooked. Most importantly, this calculation includes spending on contributions to teacher pension plans, a spending category that has become increasingly significant in recent years, and is especially important when considering the difference between government spending and that of public and independent schools. Savings estimates in this study are based on independent schools receiving 70% of the \$12,611 public school value, or \$8,827. Put another way, each student who transfers to the independent sector saves the government \$3,783.

The second aspect of the calculation is more complicated as it involves trying to estimate the number of students that would migrate to the independent school sector if the BC model were imported to Alberta. Recall that the calculations used in this estimate are based solely on the transition within religious schools. This is done for the ease of calculation rather than as a policy matter. Two calculations were made with respect to the assumed number of students that would remain in independent schools once they transitioned from a government school and their families began paying tuition.

The first estimate, which is admittedly unrealistic, is the assumption that all students remain in the independent schools. This assumes that no household is adversely affected by the imposition of tuition to the extent that it causes them to change their behaviour with respect to their children's education. While unrealistic, it does create a conceptual likely maximum value for savings that is helpful to understand the potential of applying BC's model of K-12 education delivery to Alberta.

The second estimate uses the experience of British Columbia with respect to the share of self-identified religious families and subsequent attendance at a religious school

87. Macleod and Emes (2017). *Education Spending and Public Student Enrolment in Canada, 2017 Edition*; and Angela Macleod and Joel Emes (2017). *Understanding the Increases in Education Spending in Public Schools, 2017 Edition*. Fraser Institute. <<https://www.fraserinstitute.org/sites/default/files/understanding-the-increases-in-education-spending-in-public-schools-2017.pdf>>.

88. Detailed descriptions of the data and methods for the calculation of this figure is available in: Macleod and Emes (2017). *Education Spending and Public Student Enrolment in Canada, 2017 Edition*. The spending and enrolment values that produce the \$12,611 value are available in table 2.

Nota bene that total per-capita spending in 2014/15 was \$13,115 but we have removed capital spending that could be identified in the source data. Although this value is based on 2014/15 data (the latest data currently available), it is likely a reasonable estimate for 2017/18 as the five-year average for per-student spending (less identifiable capital spending) is \$12,860 (without adjusting for inflation) and there does not appear to be a large run-up of education spending in the budget documents.

to estimate the likely share of self-identified religious families that would likely remain in independent schools in Alberta. By using the stated religiosity of both British Columbians and Albertans⁸⁹ and the percentage of school students in British Columbia who attend a religious BC independent school, the analysis generates a reasonable estimate of the number of Alberta students who could continue to attend religious schools after they transition from government to independent schools, and tuition charges are imposed.

Specifically, 15.0% of British Columbians compared to 24.3% of Albertans self-identify as Catholics. Put another way, there are roughly 1.6 Catholics in Alberta for every one in British Columbia. The paper uses this ratio to estimate the potential share of students who would remain in Catholic schools after they transition to independent schools. More specifically, the paper estimates that based on British Columbia's experience, 5.6% of self-identified Catholics in Alberta would remain in Catholic schools after they transition to an independent school with tuition (table 2). Similarly, 29.6% of British Columbians and 36.0% of Albertans self-identify as Christian non-Catholic, yielding an adjustment factor of 1.2. This results in an estimate of 4.6% of Alberta students attending Christian, non-Catholic schools after they transition to an independent school with tuition (table 2). Finally, a simplifying assumption is applied to the remaining Islamic and Jewish students based on their relatively low numbers. Specifically, students currently enrolled in public Islamic (1,724) and public Jewish (127) schools are assumed to remain enrolled after their schools are transformed to independent schools, and none return to the government system. These students are combined with the 36,767 current "private" students and included in "Other" in table 2.

Table 2: Proportion (%) of Alberta independent students after transfer

	BC model	All students
Catholic	5.6%	13.9%
Christian, Non-Catholic	4.6%	11.6%
Other	5.5%	5.5%
Total Independent	15.6%	31.0%

Source: Appendix tables 1 and 2.

As shown in table 2, the two calculations for the number of students enrolled in an independent school in Alberta ranges from 15.6% to 31.0% of total student enrolment. "BC Model" refers to the second calculation described above that uses the ratio of religiously self-identified people in British Columbia compared to the share of students attending a religiously oriented school to estimate the similar share in Alberta given its level of self-identified religious residents. The "All Students" column indicates the share if all students remained in independent schools after the transition. Again, this estimate is unrealistic but interesting in that it provides a conceptual upper ceiling on the potential for independent school enrolment in the province given the specific reforms suggested.

89. Religious affiliation in British Columbia and Alberta is from the 2011 National Household Survey, (Statistics Canada, 2011), the most recent census with religious detail.

Table 3 summarizes the potential savings from the two scenarios. The savings range between \$280 million to \$691 million based on the BC model. With total K-12 education spending for 2018/19 expected to be \$8 billion, this represents a net savings of between 3.5% to 8.6% of total spending on primary and secondary education.⁹⁰ A more in-depth breakdown of both scenarios can be found in [Appendix table 1](#).

Table 3: Cost savings estimates

Public elementary and secondary expenditures, 2014/15	7,939,547,000
Public elementary and secondary enrolment, 2014/15	629,592
Per student spending, 2014/15	12,611
Description	Savings (\$millions)
<i>BC model: 182,661 public, separate and public, religious students transferred to independent system; 108,667 return to public system</i>	280
<i>All students: 182,661 public, separate and public, religious students transferred to independent system; none return to public system</i>	691

Sources: Appendix tables 1 and 2; MacLeod and Emes, 2017, *Education Spending and Public Student Enrolment in Canada*: table 2.

A variation of the estimates in table 3 was then made to account for the recommendation to vary government grants based on the after-tax income of households, which is linked to the reforms observed in Australia and discussed previously. Specifically, families in Alberta with less than \$56,000 in household after-tax income had their government grant increased to 90% from 70%. The analysis suggests that in the status quo it would affect between 2,651 and 6,544 students resulting in additional costs of between \$10 and \$20 million annually (see [Appendix table 2](#) for more details).⁹¹

British Columbia's approach to the delivery and financing of K-12 education is but one real-world example of a jurisdiction that is achieving better educational outcomes at the same or lower costs than Alberta, indicating real opportunities for reform.

90. Alberta, Treasury Board and Finance (2018). *2018-19 First Quarter Fiscal Update ...*

91. We used a detailed custom tabulation on the presence and age of children for census families from the *2011 National Household Survey* (Statistics Canada, 2017) and family income by decile (Statistics Canada (2018). Table 11-10-0192-01. *Upper Income Limit, Income Share and Average Income by Economic Family Type and Income Decile*) to estimate that roughly 3.6% of Alberta families with school age children had incomes below \$45,366, the upper limit of the second income decile in 2010. Appendix table 2 refers to incomes below and above \$56,000 because that is the 2016 value for the upper limit of the second income decile in Alberta.

5 Conclusion and Recommendations

The paper has outlined a number of reforms that could reduce the costs and improve the performance of Alberta's K-12 educational system. The reforms have covered both the government school sector as well as the independent school sector. The basic fact that Alberta is a relatively high spender on K-12 education with only average to moderate results, particularly when compared with the lower spending province of British Columbia should give all Albertans cause to consider reform.

The key reforms discussed for the government school sector include experimenting with teacher incentive pay programs, relaxing the limits and regulations imposed on charter schools, and clarifying and strengthening the rule allowing families to send their children to schools outside their attendance (catchment) area. These reforms would strengthen the government school system, which educates a little more than 94% of all Alberta students.

The next set of reforms were focused on improving the independent school sector. They included allowing for-profit independent schools to be eligible for government grants based on the Swedish approach to K-12 education, varying the government grant amount to better reflect the household income of individual students so as to make independent schooling more accessible for lower-income families based on similar Australian reforms, and allowing competitive curricula by independent schools so long as they focus on common learning outcomes. Throughout, special attention was paid to the province's declining performance on mathematics and changes to the curriculum. The province should immediately review and assess the changes in the mathematics curriculum and their relationship to the province's declining math performance.

There is obviously some overlap between the reforms for the two sectors since curriculum competition and teacher incentive compensation could improve education in both sectors.

Finally, a conceptual analysis applied the BC model of K-12 education to Alberta to estimate the potential savings from such a reform. The savings ranged from \$280 million to \$691 million. With total K-12 education spending for 2018/19 expected to be \$8 billion, this represents a net savings of between 3.5% to 8.6% of total spending on primary and secondary education. An additional \$10 to \$20 million would be spent if Alberta increased the government grant to 90% for low-income families.

Given the current mix of comparatively high spending with modest results, Alberta should be reviewing a broad range of education reforms to achieve better value for money and improved results for both students and taxpayers.

Appendix—Detailed Savings

Sources

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Appendix table 1: Savings from transferring separate and public religious students to the independent sector

Savings when 60% return to public system

British Columbia		Alberta						
Proportion of total enrolment	Before transfer			After transfer			Savings Per student (\$)	
	Enrolment in independent sector	Proportion of total enrolment	Potential enrolment	Transferred students who return to the public system	New students	Enrolment in independent sector		Proportion of total enrolment
Independent	13.2%	5.2%	219,428	108,667	73,994	110,761	15.6%	280
<i>Christians</i>			180,810	108,667	72,143	72,143		273
Catholics	3.4%		98,628	59,275	39,352	39,352	5.6%	149
Non-Catholic	3.8%		82,182	49,392	32,791	32,791	4.6%	124
<i>Other</i>	6.0%	5.2%	38,618	0	1,851	38,618	5.5%	7

Savings when none return to public system

Independent	13.2%	5.2%	219,428	0	182,661	219,428	31.0%	691
<i>Christians</i>			180,810	0	180,810	180,810		684
Catholics	3.4%		98,628	0	98,628	98,628	13.9%	373
Non-Catholic	3.8%		82,182	0	82,182	82,182	11.6%	311
<i>Other</i>	6.0%	5.2%	38,618	0	1,851	38,618	5.5%	7

Sources: Alberta Education, 2017, 2018; FSABC, undated, a, undated, b); Statistics Canada, 2011, 2017.

Appendix table 2: Impact on savings of adding a low-income grant top-up

Reference	No grant		Students not receiving top-up (Family incomes \$56,101 and up)			Students receiving top-up (Family incomes below \$56,000)					
	Savings (\$millions)		New independent students	Savings per student (\$)	Savings (\$millions)	New independent students	Savings per student (\$)	Savings (\$millions)	Cost for existing low-income independent students (\$millions)	Adjusted savings (\$millions)	Impact of additional top- up (\$millions)
Table 1—60% return to public system	280		71,343	3,783	270	2,651	1,261	3	-3	270	-10
Table 1—None return to public system	691		176,117	3,783	666	6,544	1,261	8	-3	671	-20

Sources: Alberta Education, 2017, 2018; FISABC, undated, a, undated, b); Statistics Canada, 2011, 2017, 2018.

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