



ONTARIO'S KINDERGARTEN PROGRAM

A SUCCESS STORY Full Report

**How We All Benefit
from Quality Public
Full-Day Kindergarten**

The union represents 83,000 elementary public school teachers, occasional teachers and education professionals across the province. Its Building Better Schools education agenda can be viewed at **BuildingBetterSchools.ca**.



Elementary Teachers' Federation of Ontario
Fédération des enseignantes et des
enseignants de l'élémentaire de l'Ontario

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“... Ontario’s Kindergarten program, based on the unique partnership between a certified teacher and an early childhood educator, is an efficiently run program, as well as the model for other jurisdictions to follow nationally and internationally.”



Author



Dr. Gordon Cleveland

is Emeritus Associate Professor of Economics at the University of Toronto, Scarborough and has devoted his academic life to studying early learning and child care policies and their impacts on children and families. Dr. Cleveland has written extensively about these subjects in academic and popular journals, books and magazines. He has recently been Honorary Senior Fellow at the Graduate School of Education, University of Melbourne. In 2018, Dr. Cleveland was the main author of a widely acclaimed report to the Ontario Ministry of Education that recommended the provision of free child care services to children of preschool age as the next step to improve affordability of early education and care.

The report you are reading was commissioned by the Elementary Teachers' Federation of Ontario in response to statements made by political leaders in the Ontario government suggesting potentially damaging reforms to Kindergarten programs in Ontario. Dr. Cleveland was asked to assess the potential impacts of these reforms on Ontario's Full-Day Kindergarten model, and on the children and families who benefit from it. Dr. Cleveland has reviewed, analyzed and synthesized evidence from a very wide range of studies in Canada and other countries to perform this assessment.

Dr. Cleveland concludes that if Kindergarten policy is to be evidence-based, the Ontario government should support and champion the existing Full-Day Kindergarten program. There is good evidence that the current Ontario Full-Day Kindergarten model is working well for children and families, and that it contributes to reducing both educational inequalities and the need for special educational services. There is no evidence that increasing class size or reducing educational requirements for teachers will improve children's outcomes. There is no evidence that replacing public Kindergarten with some kind of private-sector alternative will improve the lives of children or families.

“There is good evidence that the current Ontario Full-Day Kindergarten model is working well for children and families, and that it contributes to reducing both educational inequalities and the need for special educational services.”

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Foreword

Charles S. Coffey, O.C. is the former Executive Vice President, Government Affairs and Business Development, for RBC. He has received Honorary Doctor of Laws degrees from Trent University, McMaster University and Ryerson University. Coffey was named an Honorary Chief by the Assembly of Manitoba Chiefs and appointed an Officer of the Order of Canada.

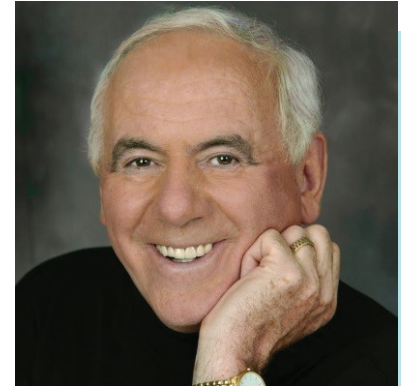
Investment in public education has long been recognized not only as a key driver of economic growth but as a powerful force in combating inequality. In today's globalized economy, which demands constant innovation and relies increasingly on the creation of new knowledge, public education is arguably the most important investment a society can make.

As someone who spent a significant part of my career in the boardrooms of leading financial institutions, I learned to recognize the importance of early childhood education and the significant impact early learning has on children's educational outcomes and ultimately on our economic output and growth. I also came to value the role early childhood education plays in reducing inequality and creating opportunities that everyone can benefit from— regardless of socioeconomic background or geographic location.

Every dollar invested in early childhood education returns upwards of six dollars to the overall economy³. This return on public investment includes higher incomes and their corresponding higher tax revenues. The most important impact that investment in public education during the early years makes, however, are the positive outcomes visible over the course of a lifetime for those who participate in it. These include greater equity, healthier social adjustment and higher civic engagement.

Ontario is a global leader in early years education. Our world-renowned Kindergarten program was built by education experts working within government, academia and front-line educators and the unions that represent them. The program's success can be largely attributed to the partnership of the Kindergarten team, which underpins the program. This team, composed of a certified teacher and a designated early childhood educator, combines the expertise of two professionals to create a truly innovative learning environment. The benefits of Ontario's Full-Day Kindergarten program include better outcomes in reading, writing, numeracy, self-regulation and social skills.

In this report, Dr. Gordon Cleveland, Emeritus Associate Professor of Economics Emeritus at the University of Toronto, has performed an extensive review of the existing body of research into Kindergarten and early years education. By looking at the evidence, he provides a comprehensive analysis to inform policy decisions regarding this important program. The conclusions of this report provide a compelling case for maintaining and investing in the Kindergarten model we have now.



It is no secret that over the past two years the provincial government considered changes to Ontario's Full-Day Kindergarten with the objective of saving money. While ultimately the government did not implement those damaging changes to Kindergarten, this report clearly outlines why it would be a grave mistake for future governments to consider doing so. Due to the positive, long-term economic impact of this program, it would ultimately cost much more than it would save to alter its existing structure or model.

Policy makers will find evidence to support additional investment in Ontario's Kindergarten program in this report. They will also find that Ontario's Kindergarten program, based on the unique partnership between a certified teacher and an early childhood educator, is an efficiently run program, as well as the model for other jurisdictions to follow nationally and internationally.

By investing in public education, and in particular in Ontario's Kindergarten program, the government can support economic growth, help address inequality, provide opportunities to all regardless of socioeconomic background, and continue to improve outcomes for all students.

3 Alexander, Craig, Kip Beckman, Alicia Macdonald, Cory Renner, and Matthew Stewart. *Ready for Life: A Socio-Economic Analysis of Early Childhood Education and Care*. Ottawa: The Conference Board of Canada, 2017



What is Ontario's Full-Day Kindergarten?

Full-Day Kindergarten is a non-mandatory, publicly funded educational program provided to children in Ontario through local public schools. It is accessible, research-based, of good quality and much loved by parents and children.

It is every child's right to receive early education and care during the school day and school year in the two years prior to compulsory elementary education. Kindergarten is the entrance to the Ontario school system for nearly 97 per cent of the children who attend public schools in the province. The Full-Day Kindergarten program is positive for children, helping ease their transition to elementary school.

A team of educators with complementary skills work together in the Kindergarten classroom: a university-educated teacher and a college-educated early childhood educator. The teacher has primary/junior qualifications and is a certified teacher registered with the Ontario College of Teachers (OCT). The early

childhood educator typically has a two-year college diploma and is registered with the Ontario College of Early Childhood Educators (CECE). This team stays with the same children for two years, through Junior and Senior Kindergarten (now sometimes referred to as Year 1 and Year 2 of Kindergarten). The team gets to know the needs of each child and often builds strong relationships with children's families.

The Ontario Ministry of Education website describes the roles of the educators in the Kindergarten classroom in this way: "ECEs have knowledge of early childhood development, observation skills and assessment skills. They bring a focus on age-appropriate program planning that promotes each child's physical, cognitive, language, emotional, social and creative development and well-being. Teachers have a knowledge of the broader elementary curriculum, assessment, evaluation and reporting, and child development. They are responsible for student learning, effective instruction and evaluation, and formal reporting to parents, based on the teacher-ECE team's assessment of children's progress." (Ontario Ministry of Education, 2019a)

Ontario's publicly funded Kindergarten classrooms have a mandated play- and inquiry-based approach to learning, a move away from teacher-centred, rote-learning approaches. This "play-based learning" approach has been strongly recommended by the Council of Ministers of Education (Council of Ministers of Education, Canada, 2012), and reflects international research on effective pedagogical practices. The Ontario Kindergarten curriculum has a similar play-based focus as the child care curriculum in Ontario, lessening the differences that children may experience when they make the transition to Full-Day Kindergarten. The purpose of Full-Day Kindergarten in Ontario is to provide a strong foundation for learning in a safe and supportive environment where physical, social, emotional and cognitive skills are promoted for all children.

Ontario's Full-Day Kindergarten implies not less than five hours per day of an educational program for 194 days per year. But the program was always conceived as much more than just a longer day in school (Pascal, 2009). Full-Day Kindergarten allows very different things to happen in the classroom. The average Kindergarten class size is 26 children, but with two educators in the classroom, the effective class size is smaller. Having a team with a teacher and a designated early childhood educator in the classroom enhances the possibilities of small group work and individualized attention to student needs, which is crucial to quality experiences in Kindergarten. It allows a wider variety of learning experiences. There can be more opportunities for teacher-parent relationships and more support for working parents. At the same time, the per-student cost of Full-Day Kindergarten is reasonable and has proven to be stable over time.

Full-Day Kindergarten is 10 years old in Ontario. The initial rollout began in 2010 and was fully implemented by 2014. The evidence reviewed below tells us that we can expect that two years of high-quality Full-Day Kindergarten will have a range of important impacts on children and families. These include the following:

- Improved vocabulary and language abilities for children by the end of Kindergarten;
- Enhanced reading and mathematical abilities for children by the end of Kindergarten;

“ ... that two years of high-quality Full-Day Kindergarten will have a range of important impacts on children and families ... ”

- Increased self-regulation capabilities, socio-emotional and behavioural abilities of children by the end of Kindergarten;
- Improved school completion and post-secondary attendance by Full-Day Kindergarten students as they progress through their school experiences;
- Reductions in special and remedial education expenditures on students who have been in Kindergarten;
- Better mental health of students and enhanced student well-being;
- Increased labour force participation, employment hours and lifelong earnings for Full-Day Kindergarten students as they move through their adult lives;
- Increased payment of taxes on these higher earnings to help support socially desirable government expenditures;
- Improved health of former Full-Day Kindergarten students and lower necessary health expenditures;
- Reductions in social assistance payments;
- Increased participation in community leadership and civic engagement by former Full-Day Kindergarten students; and
- Increased employment hours, reduced absenteeism, increased labour force participation and increased earnings by parents (especially mothers) of young children attending Full-Day Kindergarten.

Significantly, we expect that Full-Day Kindergarten will be particularly positive for children from lower-income families, immigrant families, racialized communities and families with English as a second language), so that Full-Day Kindergarten will play a positive role in reducing social and economic inequalities in Ontario. The Full-Day Kindergarten model is a new one; it has not yet reached its full potential. The priority should be to ensure that Ontario's excellent Full-Day Kindergarten model fulfills its promise.

The Current Government's Uneasy Relationship with Kindergarten

When Tim Hudak was Conservative leader, he said Ontario could not afford Full-Day Kindergarten. Even in 2013, when Full-Day Kindergarten already existed in 1,700 schools across Ontario, Mr. Hudak called for a halt until the provincial books were balanced (CTV News/Canadian Press, Jan 24, 2013). Hudak questioned whether both teachers and ECEs were needed in Kindergarten classrooms and called for a return to a teacher-only model (Rushowy, 2014).

The Ford government began with similar views. It considered rolling back elements of educational quality in Full-Day Kindergarten (Jones, Jan 30, 2019; Rushowy and Monsebraaten, Mar 18, 2019) on the grounds that Kindergarten was too expensive.

There was a flurry of reports in the press about possible reforms being discussed:

- larger class sizes in Kindergarten (Jones, 2019);
- reducing or eliminating university-educated teachers in Kindergarten (Rushowy and Monsebraaten, 2019); and
- abolishing Kindergarten entirely and instead subsidizing some form of early learning through child care centres (without university-educated teachers) instead of through public schools (Rushowy and Monsebraaten, 2019; Kan, 2019; CBC News, 2019).

Reforms like these could unravel what is an excellent model of Kindergarten that has a class size average of 26, a team in each classroom composed of an Ontario-certified Kindergarten teacher and a designated early childhood educator, a play- and inquiry-based curriculum, with Kindergarten available to everyone in the local public school (plus before- and after-school child care available in many schools). The government did not appear to appreciate the important change in children's early experiences that Full-Day Kindergarten has made possible and the consequent impact on their growth and development.

Pressed by public criticism, the Ford Government has had a welcome change of heart. Premier Doug Ford promised on January 30, 2019, that, "Whatever we do, we want to enhance the program with education. We don't want to hurt the program whatsoever [emphasis added]" (D'Mello, CTV News Toronto).

With the Elementary Teachers' Federation of Ontario making this a major demand at the bargaining table, the Ford Government finally provided "a written guarantee there would be no change to the structure of the kindergarten program which features a teacher and early childhood educator working as a team in classes with a maximum of 29 children." (Miller, 2020). This should provide a firm basis for co-operation on continuing to improve our existing model of Full-Day Kindergarten in Ontario. However, the written guarantee lasts only until the end of the ETFO contract in 2022, so parents and other advocates for Ontario's Full-Day Kindergarten need to remain at the ready.

We have looked carefully at what the research says about Kindergarten and full-day Kindergarten programs in general, and Ontario's Full-Day Kindergarten program. Much of the research on children, families and Kindergartens comes from the U.S. or other countries, but some comes from Canada. The research on children and families tells us that:

- A. Early childhood is a vital time for investing in children's development;
- B. Kindergarten is good for children, parents and society;
- C. When Kindergarten is of particularly high quality, its effects are even better;
- D. Kindergarten has a big role to play in reducing inequality;
- E. Full-day Kindergarten programs have been proven to be better than half-day programs;
- F. Ontario's Model of Full-Day Kindergarten is especially positive for children and parents;
- G. Full-Day Kindergarten is Often Where Children's Educational Needs Are First Discovered and Addressed;
- H. Increasing class sizes will lower Kindergarten quality;
- I. Lowering teacher education qualifications will lower Kindergarten quality; and
- J. Ontario's Full-Day Kindergarten is already delivered in a cost-effective way.

A Early Childhood is a Vital Time for Investing in Children's Development

Children develop rapidly in the years before compulsory schooling begins at the age of six. Everything that happens both before birth and in the first years of life can have extraordinarily important impacts on a child's development and learning. The first six years are a period of rapid neurological development in which stimulating environments play a very important role. It is useful to think of child development as the accumulation and refinement of a set of "capabilities" or capacities to function. Very broadly, these can be categorized as cognitive, non-cognitive and health/physical capabilities.

The cognitive skills include language and vocabulary, ability to reason and problem-solve, ability to remember and access memory, ability to speak and listen, and ability to count and reason mathematically. Language and vocabulary skills are particularly critical to the development of later literacy success.

The non-cognitive skills are sometimes called social-emotional skills or character skills. They are closely tied to a child's personality. They include social skills and sociability, ability to negotiate and interact positively with others, conscientiousness, perseverance, self-control and ability to self-regulate, resilience to adversity, self-esteem, empathy, honesty, tolerance of diverse opinions, and openness to experience.

Health or biological capabilities include the development of physical skills (both fine-motor and gross-motor skills), habits of cleanliness and reduction of risk of disease. Some aspects of health are, of course, beyond the control of the developing child and his/her family—for instance, the prevalence of disability or chronic disease. However, the response to disability or disease is not pre-determined.

No child's future is predestined at birth; the old distinction between nature and nurture is no longer useful. Research now indicates that it is more a case of nature via nurture that optimizes children's development. A child's abilities by the time compulsory school starts are produced by a combination of parental and public investments (of time, money, services and much love), environmental influences and genetic components. Even in the case of influences that are genetic, gene expression is now recognized to be governed by environmental conditions.

However, if a child fails to develop certain skills early in life, it is not always possible to effectively develop these skills later. In other words, there are critical periods in a child's development. For instance, the period before about age 10 is a critical one for learning language, grammar and syntax.

For the development of most cognitive and non-cognitive skills, early childhood is a sensitive period. It is possible to develop, update and amend these skills after early childhood, but later is always harder than earlier. In the language of economists, investment in cognitive and non-cognitive skills of children is considerably more productive when they are young than when they are older. Put another way, the returns on investment in the early years are substantially higher than in the later years. In particular, the Kindergarten and elementary school years are very sensitive ones for the development of children's cognitive and non-cognitive skills.

Early investment is not only desirable because of early childhood being a sensitive period. It is also true, as Nobel Prize-winning economist James Heckman is fond of saying, that "early learning begets later learning and skills beget skills" (Knudsen, Heckman, Cameron and Shonkoff, 2006, p. 10159)². In other words, the acquisition of some skills early on in life makes it much more possible to develop later skills. This is true in obvious ways about things like math: learning how to count and learning the concepts of more and less, of rapid growth and slower growth, etc., is essential before learning more complex mathematical concepts and relationships.

² More completely: "Life cycle skill formation is dynamic in nature. Skill begets skill; motivation begets motivation. Motivation cross-fosters skill and skill cross-fosters motivation. If a child is not motivated to learn and engage early on in life, the more likely it is that when the child becomes an adult, he or she will fail in social and economic life." (Heckman, 2008, p. 290)

However, this is also true, perhaps especially true, of socio-emotional skills. Skills of self-regulation, of taking turns, of being able to articulate your needs, of being able to negotiate with and co-operate with others, are an essential foundation for all later learning. And these skills are laid down, adjusted and amended very early in life.

All of this is the background to understanding Heckman's well-known and much-appreciated diagram (see below) about the returns available on investing at different points across the life course. Investment in the very earliest years (including parental investment) has the largest return. Investment at ages four and five, which Heckman labels as "preschool" (the ages at which Kindergarten is offered in Ontario) are not far behind. Investment at these ages can be very effective in enhancing a child's development. Later investments often come too late to have the desired impacts.

The cognitive and non-cognitive skills first learned in early childhood link directly to what are somewhat grandly called 21st century competencies. As the Ontario government (Ontario Ministry of Education, 2016) describes them "[t]he most prominent 21st century competencies...are associated with critical thinking, communication, collaboration, and creativity and innovation" (pp. 11-12). These competencies reflect changes in society, in particular, "changes in the workforce from an industrial model of production to a rapidly transforming, technology-driven and interconnected globalized knowledge economy. Such an economy requires competencies suited to dynamic and unpredictable models of economic and social development." (p. 6)

RATE OF RETURN TO INVESTMENT IN HUMAN CAPITAL

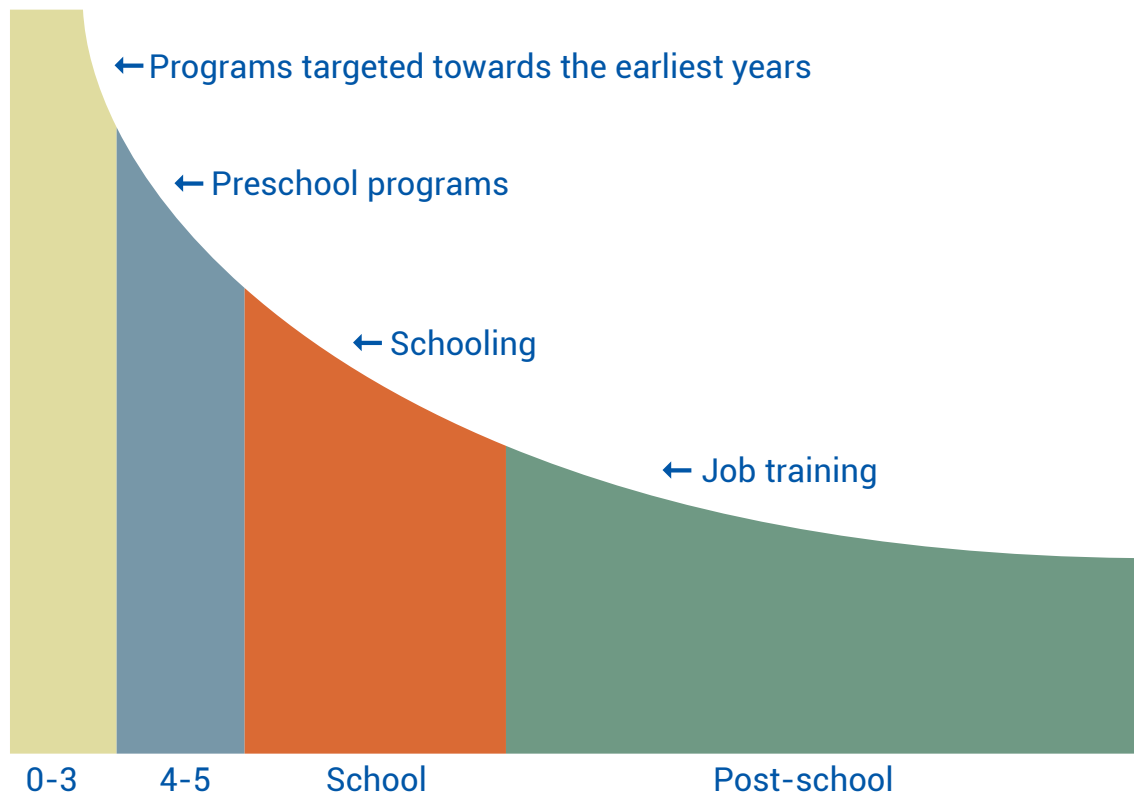


Figure 11. Returns to a Unit Dollar Invested by Stage of the Life Cycle.

From: Conti and Heckman (2012) *The Economics of Child Well-Being*

B Kindergarten is Good for Children, Parents and Society

It is obvious to most parents that Kindergarten is good for children. Kindergarten is enormously popular. Enrollment in Kindergarten across Canada is over 95 per cent for children going to public schools even in provinces like Ontario where enrolment in Kindergarten is voluntary. It is also much appreciated by families and governments that Full-Day Kindergarten programs help parents maintain their employment and incomes when children are young. The support for Kindergarten is not only widespread among families who use it; in a recent survey of 1,500 Ontario residents (Innovative Research Group, 2019) only 11 per cent of Ontario residents said they did not support the current model of Full-Day Kindergarten in Ontario.³

As we show below, full-day Kindergarten programs are particularly strong in promoting children's development. However, even half-day Kindergarten has had important benefits for children and families. Elizabeth Dhuey, an economist from the University of Toronto, looked at the rollout of (largely half-day) publicly funded Kindergartens (for five-year-olds) in the U.S. over the last 70 years. She found a general benefit from Kindergarten, namely an almost eight per cent reduction in being below grade for age (i.e., being retained in grade). In other words, Kindergarten has, throughout its history, laid the groundwork for improved academic success in school. The children benefiting most in the U.S. were Hispanic children, non-English speakers, children from immigrant households and children from lower socioeconomic status families. There is evidence that children who were previously in lower-quality alternative arrangements benefit the most when accessibility to Kindergarten is phased-in.



Dylan Conger, professor of Public Policy and Public Administration at George Washington University, along with her colleagues, provides research evidence relevant to the effects of Junior Kindergarten. She has examined (Conger et al., 2019) the effects of attending state-funded, public-school-based pre-Kindergarten on children. This is the closest U.S. equivalent to Ontario's Junior Kindergarten. Conger found that children attending pre-Kindergarten (as well as five-year-old Kindergarten) did better in their transitions to Grade 1. Students who were learning English and attended pre-Kindergarten picked up the language more quickly than children who only attended Kindergarten (for five-year-olds).

Hirokazu Yoshikawa, a developmental psychologist and Professor of Globalization and Education at New York University, provides further information about the importance of early learning. He has summarized the evidence based on preschool education with a distinguished group of co-authors (Yoshikawa et al., 2013). The studies refer, generally, to large-scale public preschool programs, including pre-Kindergarten (akin to Junior Kindergarten). The review is published jointly by the Society for Research in Child Development and the Foundation for Child Development. The authors cite evidence of a gain of about a third of a year of additional learning across language, reading and math skills due to attending public preschool. Even larger gains were found for participation in high-quality programs.

³ Another 14 per cent said they didn't know enough to say.



C When Kindergarten is of Particularly High Quality its Effects are Even Better

The evidence in favour of high-quality Kindergarten is very strong. The best-known long-term study of the potential impacts of high-quality Kindergarten is one that began in Tennessee in 1985, usually known as the Tennessee STAR⁵ study. Regular classes in Kindergarten and the early years of school at that time in Tennessee had 22–25 pupils. An influential study (Glass and Smith, 1979) had proposed that there were big potential benefits from lowering class size, but not just by a little bit. The relationship between class size and learning was non-linear; the big gains would come if class sizes were reduced to about 15 students.

The Tennessee legislature decided to set up a random assignment study of this issue before committing significant public funds to lowering class sizes. About 11,600 students and their teachers from 80 schools were randomly assigned to either small (13–17 students) or regular (22–25 students) classrooms over several years (Krueger, 1999). Students were given a battery of standardized tests at the end of each year and followed through school for a number of years. Students were followed up at ages 25–27 with administrative data from tax returns that provide information on college attendance, employment, earnings, retirement savings, home ownership and marriage.

Using a measure of classroom quality for the Kindergarten class, Harvard economist Raj Chetty and his colleagues (Chetty et al., 2011) found that students who attend higher-quality Kindergarten classes are more likely to attend college, are likely to attend a higher-quality college, have higher earnings at age 25–27, and score higher on an index that summarizes other effects such as home ownership, retirement savings and marital status.

Kindergarten has had important employment effects too. Jonah Gelbach, an economist and professor at University of Pennsylvania Law School, has looked at the impact of Kindergarten expansion in the U.S. on mothers' employment (Gelbach, 2002). He finds that public school enrollment for five-year-olds significantly increased mothers' employment (an increase of between 6 and 24 per cent depending on the labour supply measure examined—employment, hours of work per week and per year, social assistance receipt, wage and salary income—and on the number of parents in the household.⁴

Our conclusion? Full-day Kindergarten programs are better, but even half-day Kindergarten has been very beneficial for children, families and society. As the voluminous literature on the benefits of early childhood education suggests, children can benefit in cognitive and socio-emotional development from supportive and educational group experiences in early childhood. And, even before full-day Kindergarten programs became widespread, the convenient and free availability of Kindergarten has been a mainstay of support for mothers' employment and family incomes.

⁴ Single mothers with one child aged five, but also a younger child, did not have employment benefits from Kindergarten.

⁵ The full name of this study is the Tennessee Student/Teacher Achievement Ratio experiment.

In other words, there are clear, positive, long-term effects 20 years and more after attending a good-quality Kindergarten. Translated into numbers, Chetty and his colleagues calculate that an individual who attends a “better” Kindergarten classroom (i.e., where classroom quality is raised by one standard deviation) will have earnings nearly 10 per cent higher at age 27. Continued throughout their working life, this would translate into a lifetime earnings gain of about \$39,100 for this student (expressed in 2009 U.S. dollars). Across an entire classroom, the present value of this benefit would be \$782,000 (Chetty et al, 2011, p. 1656). Good-quality Kindergarten can matter a great deal, and the value of an investment in Kindergarten can be much higher than the costs.

The Tennessee STAR study was important in at least one other way. It gave us good evidence about the problem of “fade-out.” Many studies of policy and program changes affecting young children find that effects seem to diminish or disappear several years later. This has led some researchers to suggest that the policy and program changes are not worthwhile. For the Tennessee STAR study, the academic effects (i.e., standardized test scores) of better-quality Kindergarten likewise faded. Impacts on test scores were no longer statistically significant by Grade 8 (Krueger and Whitmore, 2001). And yet, Chetty and his colleagues found strong effects on earnings and a host of other adult outcomes for those who attended better-quality Kindergartens. The explanation is that high-quality Kindergartens build non-cognitive skills (e.g., effort, initiative, lack of disruptive behaviour) that have returns in the adult labour market, but do not necessarily continuously improve performance on standardized tests of cognitive abilities throughout school (Chetty et al., 2011, p. 1597).

Many other studies confirm the strong positive effects on children of high-quality Kindergarten for four- and five-year-olds. For instance, Bartik, Gormley and Adelstein (2012) calculate the long-term benefits of universal pre-Kindergarten in Tulsa, Oklahoma. This was a universal program for four-year-olds provided in the public schools. Teachers had a bachelor’s degree in education with a focus on young children. Maximum class size was 20 students, with both a teacher and assistant teacher in each classroom. The authors found long-term benefit–cost ratios between three-to-one and four-

to-one. Craig Alexander and colleagues (Alexander et al., 2017) in a recent Canadian study of the benefits and costs of expanding early childhood education attendance for children aged two to four found similar benefit-cost ratios. Brenda Taggart from University College London and her colleagues from Birkbeck College and Oxford University (Taggart et al., 2015) have found strong and long-lasting effects of high-quality preschool in England on children up through age 16. “Going to a high-quality preschool...influences both attainment and progress in early school careers and set children on particularly beneficial learning trajectories....” (Taggart et al., 2015, p. 29).

Phyllis Lee and Karen Bierman, from Pennsylvania State University (Lee and Bierman, 2015), find that supportive teacher–student relationships and classroom emotional support in Kindergarten are a particularly important component of high-quality Kindergarten for socioeconomically disadvantaged children. These factors can play a vital role in reducing children’s aggressive behaviours, diminishing social withdrawal, promoting learning engagement and building emergent literacy skills. Shannon Wanless, from the University of Pittsburgh, and her colleagues (Wanless et al., 2011) confirm that behavioural regulation is a particularly important issue for children from low-income families entering pre-Kindergarten in the U.S.

Michel Boivin, Canada Research Chair on Child Social Development at the School of Psychology at Laval University, together with Christa Japel, Professor in the Department of Education and Specialized Training at University of Quebec at Montreal and co-authors (Guay et al., 2019) broaden these conclusions. They find that socio-emotional support is important for all students in Kindergarten. Their study of over 800 Kindergarten students in Quebec found that Kindergarten teachers’ relatedness with students strongly encouraged students’ intrinsic motivation for reading and reading achievement.

Our conclusion? High-quality Kindergarten is very good for children. Well-trained teachers and small, effective class sizes are important in producing this quality. The effects of good-quality Kindergarten experiences are long-lasting, and socio-emotional support is a key part of providing positive Kindergarten experiences.

D Kindergarten Has a Big Role to Play in Reducing Inequality

Inequality of opportunities and outcomes appears early in children's lives. Janet Currie, a Canadian by birth and Professor of Economics and Public Affairs at Princeton University, suggests (Currie, 2011) that differences between children that appear to be innate are often the result of environmental factors. "[I]ndividuals may start with very different endowments at birth because of events that happened to them during a critical period: the nine months that they were in utero. In turn, endowments at birth have been shown to be predictive of adult outcomes and of the outcomes of the next generation." (Currie, 2011, p. 1)

An international team of social scientists, including Miles Corak from the University of Ottawa (Bradbury, Corak, Waldfogel and Washbrook, 2012), find that young Canadian children's outcomes, both cognitive and socio-emotional, vary substantially according to family socioeconomic status (SES). When vocabulary scores are standardized, the difference between children in low-SES households and those at the top is about three-quarters of a standard deviation. That's a lot (although less than in the United States, the U.K. and Australia, as the authors show). The impact of SES on socio-emotional outcomes appears to be about half as large as for cognitive/vocabulary scores in Canada. The most important takeaway from this evidence is that, even though Canada is less unequal than some other countries, inequality of family circumstances still affects children from a very young age.

As James Heckman reminds us, investments to reduce inequality are the most effective at the very youngest ages. For instance, access to good-quality child care services can have very important effects on children's development and particularly for children faced with some sort of disadvantage. The positive effects of good-quality child care in narrowing disadvantage are echoed by many researchers, including Greg Duncan,

“... investments to reduce inequality are the most effective at the very youngest ages.”

Distinguished Professor in the Department of Education, University of California (Irvine) and Aaron Sojourner (2013) and Oxford University's Kathy Sylva and her colleagues (Sylva et al., 2008). High-quality child care is capable of reducing inequality. Isabelle Laurin, Nathalie Bigras and their co-researchers in Quebec likewise find that child care delivered in a *Centre de Petite Enfance* (CPE, a non-profit early childhood centre) ensures that children from low-income families are less likely to be vulnerable in two or more areas of development compared to low-income children who did not attend.

However, previous research (Cleveland, 2016) suggests that much of this promise remains unfulfilled in Canada. Many children from disadvantaged families (defined here as families in which the mother has a high school education or less) do not gain access to licensed child care services in their preschool years, despite the fact that many could be eligible for child care subsidies. When the mother has a college or university education, children are much more likely to be in licensed child care services.

Part of the reason for this is affordability; the full fee for good-quality child care services in Canada is well beyond the reach of low-income families. In fact, even accounting for the availability of child care subsidies, there is good evidence that only about 25 per cent of Ontario families with children younger than compulsory school age can afford licensed child care (Cleveland, 2018). As a result, it is no surprise that most users of licensed child care come from middle- and higher-income families.

Kindergarten is different. Kindergarten is universal and available at the local school; nearly everyone goes. And Kindergarten is free; there is no means test, no affordability issue. What this means is that Kindergarten is the first service in a child's life where all children—rich and poor and in-between—attend together.⁶ It is a key time for the development of all children, and a crucial time at which inequality can be addressed.

6 Of course, universal health care services in Canada are very important in reducing the effects of inequality as well.

E Full-Day Kindergarten Programs Have Been Proven to be Better Than Half-Day Programs

Full-day Kindergartens have been becoming more and more popular and widespread. Children attend full-day Kindergarten in Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, British Columbia and the Northwest Territories. Some school divisions in Manitoba and Saskatchewan also have full-day Kindergarten programs.

Research on the effects of full-day Kindergarten can be challenging, because there is almost no research based on random assignment. In research studies, many of them from the U.S., the children who are in full-day Kindergarten programs are often systematically different from those in half-day Kindergarten programs. In 1977 about one-quarter of children in the U.S. attended full-day Kindergarten in the year before compulsory school. By 2003, this had increased to about two-thirds of U.S. children. But, full-day Kindergarten included disproportionate numbers of Black and low-income children—about 80 per cent of Black children and over 70 per cent of children in low-income families. Given the effects of race and economic disadvantage in the U.S., that means that many children in full-day Kindergarten start off behind those children in half-day Kindergarten (Wanless et al., 2011). Some studies of full-day Kindergarten's effects adjust their estimates adequately for family background characteristics, but others do not.

On top of this, in other jurisdictions what happens in a full-day Kindergarten program varies a great deal. Many Kindergarten programs are oriented towards early cognitive achievement: reading, writing, mathematics and other structured learning activities. Others focus on play, socialization, learning how to get along with peers and adults, and learning self-regulation skills. Different full-day Kindergarten programs may have different effects on children's development in the short and long terms.

Harris Cooper, Professor in the Department of Psychology and Neuroscience at Duke University, together with colleagues, has carefully summarized findings from largely American literature on full-day Kindergarten in a meta-analysis (Cooper et al., 2010). Nearly all of the studies focus on academic impacts. Compared with half-day Kindergarten, verbal or math achievement was higher by the end of the Kindergarten year (by about 0.25 of a standard deviation). "Expressing this association in a different metric, *the average (50th percentile) child in FDK performed better on academic tests than 60% of children in HDK at the end of the kindergarten year* [emphasis in original]." (Cooper et al., 2010, p. 62)

The only well-known random assignment study of full-day Kindergarten in the U.S. is by James Elicker and Sangeeta Mathur from the Department of Child Development and Family Studies at Purdue University. The experiment (Elicker and Mathur, 1997) was conducted in a middle-class neighbourhood in a Midwestern community in one school district. Just fewer than 250 students were involved, spread over 12 classes. Children were randomly assigned to the full-day or half-day Kindergarten program; teachers in the two programs were highly educated and similar. Both half-day and full-day programs offered similar activity-based and child-centred programming. All Kindergarten teachers had participated in periodic staff development activities focused on developmentally appropriate practices over a two-year period prior to the beginning of the study.



“... there are frequently positive socio-emotional impacts that have long-term effects on children’s development.”

It is revealing to consider how time was spent in the two types of classroom. In half-day classes, about half the time was spent in large-group, teacher-directed activities. In full-day classes, only 30 per cent of the time was spent in large-group, teacher-directed activities. Much more time in full-day Kindergarten was spent on child-initiated activities, half again as much as in the half-day program.

Both half-day and full-day teachers were interviewed about the advantages and disadvantages of the two programs. Teachers shared several important opinions, saying that:

- Full-day Kindergarten was better at easing the transition to first grade, helping children adapt to the six-hour school day.
- Having more time available in the school day offered more flexibility and more time to do activities during free choice times.
- Full-day Kindergarten classes were less stressful and frustrating for children, because they had time to develop interests and social and creative activities more fully.
- The full-day Kindergarten schedule allowed more appropriate challenges for children at all developmental levels. For children with developmental delays or those “at risk” for school problems, there was more time for completion of projects and more time for needed socialization with peers and teachers. For more advanced students, there was time to complete increasingly challenging long-term projects.

There was no standardized testing of children in this study, so children’s progress was quantitatively measured by results on report cards (so admittedly teacher subjectivity could be an issue). Kindergarten report card progress and readiness for first grade were rated significantly higher for full-day children, but the differences were modest rather than large.



Janette Pelletier, from the Ontario Institute for Studies in Education at the University of Toronto, and her colleagues report results that are consistent with these observations about full-day Kindergarten (Heagle et al., 2017). Kindergarten children in Ontario’s full-day program reported that social activities were what was most important at school, whereas children from half-day programs cited academic activities as most important.

Robert Baskett, from the University of Southern Maine, and his colleagues (Baskett et al., 2005) study half-day and full-day Kindergarten in a Maine school district. Overall, those children in full-day Kindergarten showed greater improvement on a child development scale and educational measures. Furthermore, results from teacher and parent questionnaires indicated a high degree of satisfaction with full-day Kindergarten. Satisfaction results for parents and teachers mirror those found in other studies (Elicker and Mathur, 1997).

It is important to note that many studies have found evidence of the “fade-out” of academic effects of full-day Kindergarten. This leads some researchers to want to throw the proverbial baby out with the bath water, to reject the move to full-day Kindergarten because educational advantages do not appear to be permanent. However, as described below, there are frequently positive socio-emotional impacts that have long-term effects on children’s development.

For instance, Cooper (Cooper et al., 2010) found that academic advantages of full-day over half-day Kindergarten faded out by third grade. The half-day children caught up. Gottfried and Little (2018) find an initial academic boost from full-day Kindergarten for children with disabilities, but then a fade-out. Wolgemuth and colleagues (Wolgemuth et al., 2006) echo these findings for children without disabilities.

Elizabeth Votruba-Drzal, Professor in the Department of Psychology at the University of Pittsburgh, with colleagues, has studied academic progress in full- and half-day Kindergarten up to fifth grade in the U.S. (Votruba-Drzal et al., 2008). They found greater reading and math skills in Kindergarten with fade-out after that. She finds that the fade-out is in part explained by differences in the children who attend part-day versus full-day Kindergarten and differences in the characteristics of the schools offering each.

Robert A. Hahn, an epidemiologist at the Centers for Disease Control and Prevention in the U.S., together with colleagues, has also summarized the literature on full-day versus half-day Kindergarten with special interest in health effects (Hahn et al., 2014). There is evidence of improved academic, verbal and math achievement with full-day Kindergarten, but also fade-out of results by third grade. The authors find that good follow-up experiences in elementary education are likely to promote longer-lasting benefits.

The problem of fade-out is a familiar one in studies on early childhood education. Back in the 1960s, Westinghouse Learning Corporation did an evaluation study of the Head Start programs in the U.S. that were very new at that time (Westinghouse Learning Corporation and Ohio University, 1969). They found cognitive and language gains at first grade, but these appeared to fade-out by second or third grade. However, although it did not receive much attention at the time, the Westinghouse study also found positive results in children's socialization and health care that did not disappear.

We now have strong evidence that the effects of Head Start are long-lasting (Garces, Thomas and Currie, 2002; Carneiro and Ginja, 2014). And there is good evidence for positive long-term outcomes from a host of other early childhood intervention programs in the U.S. (Elango, Garcia, Heckman and Hojman, 2015). In nearly all of these cases, there is fade-out of the early, very promising, impacts: "a general pattern for IQ and achievement test scores is that they tend to surge while children are in pre-K and then fade. In some cases, they completely dissipate" (Elango et al., 2015. p. 31; see also Jenkins et al., 2015). However, as the authors make clear, this is not inconsistent with very positive long-term effects.

For instance, the well-known Perry Preschool Program, a randomized trial focused on disadvantaged three- and four-year-old African American children in the U.S., initially boosted the IQs of participants, but these effects soon faded. Economist James Heckman, from the University of Chicago, has thoroughly examined (Heckman, Pinto and Savelyev, 2013) the long-term evidence from the Perry experiment, and the pathways through which it influenced children as they grew up. His, perhaps surprising, conclusion is that the primary pathway of effects was through persistent improvements in personality skills and educational motivation.



In other words, enhanced personality skills (i.e., socio-emotional skills) promote learning and that leads to better long-term life outcomes (labour market outcomes, health behaviours and reduction in anti-social criminal activities). As Heckman and Kautz (2012) argue, achievement tests do not capture soft skills—personality traits, goals, motivations and preferences—that are valued in the labour market, in school and in many other domains. Gains in soft skills in Kindergarten will influence future life success but may or may not show up in test scores in later grades.

The only long-term study (i.e., into adulthood) of Kindergarten's effects is the Tennessee STAR study. As described above, that experiment showed very strong positive long-term effects even though the initial impacts had apparently faded out beyond Grade 8 (Chetty et al., 2011).

Our conclusion is that full-day Kindergarten programs provide advantages over half-day programs for most children, permitting a greater focus on learning through play and on monitoring and encouraging the development of individual children. There is evidence of reduced stress for children. There typically are significant advantages of full-day Kindergarten programs in performance on academic tests in the early grades. These advantages may fade, but there is also evidence that many programs that boost children's early development have long-lasting impacts through the early acquisition of enhanced soft skills.



F Ontario's Model of Full-Day Kindergarten is Especially Positive for Children and Parents

A full-day Kindergarten program was recommended by Special Advisor on Early Learning Dr. Charles Pascal in a report to the Premier of Ontario in 2009 (Pascal, 2009). There have been only a small number of studies of Ontario's Full-Day Kindergarten program since its rollout was completed in 2014. Of course, none of these studies can consider the long-term impacts of Full-Day Kindergarten into adulthood, because the program is too recent.

One possible impact of Ontario's Full-Day Kindergarten program is on mothers' employment. As noted above, half-day Kindergarten was found to substantially boost mothers' employment in the U.S. (Gelbach, 2005). Arguably, the same has happened in Canada, although there is a paucity of research.

We certainly are aware of the major impact of full-day child care on mothers' employment, particularly in Quebec (Lefebvre and Merrigan, 2008; Lefebvre, Merrigan and Verstraete, 2009; Fortin, 2017). When child care became affordable in Quebec in the late 1990s, a large number of additional mothers (about 70,000, according to Fortin) entered the labour force. And according to the work by University of Quebec at Montreal economists Pierre Lefebvre, Philip Merrigan and Matthieu Verstraete (2009), this was a long-lasting change in employment behaviour.

University of Toronto economist Elizabeth Dhuey and co-authors have considered the impact of Ontario's Full-Day Kindergarten on mothers' employment in two studies. Looking at the Full-Day Kindergarten rollout from 2010–14, and using a powerful difference-in-differences method, Dhuey, Lamontagne and Zhang (2019) found an increase in full-time work particularly for mothers with only one child. These mothers are about 11% more likely to work full time, and increased their hours worked by about eight per cent. This impact is concentrated among mothers with lower education levels.

“... enhanced personality skills (i.e., socio-emotional skills) promote learning and that leads to better long-term life outcomes ...”

Elizabeth Dhuey, along with Wilfrid Laurier economists Jean Eid and Christine Neill (Dhuey, Eid and Neill, 2019) looked at the same issue with a focus on the experience in French-speaking Kindergartens in Ontario. These Kindergartens moved to full-day education much earlier than English-speaking Kindergartens. Dhuey and colleagues found modest effects for mothers in two-parent families (perhaps two to four per cent increase in employment and hours worked). However, there are much larger effects on employment and hours of work for single mothers. For single mothers, employment rates are up to 11 percentage points higher, and there is a shift from working fewer than 15 hours per week to working longer hours.

The most complete study to date of child outcomes from Ontario's Full-Day Kindergarten program comes from Janette Pelletier, Professor of Applied Psychology and Human Development at the Ontario Institute for Studies in Education, and James Corter, Professor of Statistics and Education at Columbia University. In Peel Region, just west of Toronto, they followed the experiences of about 600 children in Kindergarten and the first years of school (Pelletier and Corter, 2019). Some of these children experienced only half-day Kindergarten (the model before the Full-Day Kindergarten reforms) before entering grade school. Others had a half-day in Junior Kindergarten but a full-day in Senior Kindergarten the next year. Still others had the Full-Day Kindergarten experience at both Junior and Senior Kindergarten levels.

Eighteen public schools in Peel participated in the study. Reflecting this multicultural region, about 60 per cent of the families in the study spoke a language other than English at home with the children.



The study team administered a series of tests of cognitive and non-cognitive outcomes at the end of Senior Kindergarten, Grade 1 and Grade 2. There were six child outcome variables for each year. As described below, the children in Full-Day Kindergarten have had different and more positive outcome scores than those in half-day programs.

Ontario's Full-Day Kindergarten is unique in its design. It is a two-year program (i.e., lasting for the year in which children turn four and the year in which they turn five), whereas most Kindergarten programs in other jurisdictions cover only one year—usually for five-year-olds. Typically, children will keep the same teaching team for both years of Kindergarten, emphasizing continuity and stability in this first acquaintance with schooling. In contrast, many jurisdictions elsewhere in Canada or in the U.S. have some form of preschool or pre-Kindergarten, instead of four-year-old Junior Kindergarten. Some of these preschool arrangements in other jurisdictions are universal and free, but many are targeted and may require payment of a fee.

Ontario Kindergartens have a mandated play- and inquiry-based approach to learning—a move away from teacher-centred, rote-learning approaches. This Kindergarten curriculum has the same play-based focus as the child care curriculum in Ontario, reducing the number of differences children perceive when they make the transition to Kindergarten. The purpose of Full-Day Kindergarten in Ontario is to provide a strong foundation for learning in a safe and supportive environment where physical, social, emotional and cognitive skills are promoted for all children. Full-Day Kindergarten implies not less than five hours per day of an instructional program (not including recess and lunch) for close to 200 days per year. School boards must maintain a board-wide class size average for Full-Day Kindergarten of no more than 26 students.

Perhaps the most distinct feature of Ontario Kindergartens is that there is more than one educator in each classroom.⁷ There is a partnership of a certified teacher and a designated early childhood educator, known as the Kindergarten team. The Kindergarten teacher has an undergraduate three- or four-year university degree plus a one- or two-year university-level Bachelor of Education degree. Many have further qualifications. The teacher has Primary/Junior qualifications and is a certified teacher registered with the Ontario College of Teachers. The early childhood educator typically has a two-year college diploma in early childhood education. Some have a university degree. They are registered with the College of Early Childhood Educators.

Typically, early childhood educators bring to the Kindergarten classroom two to four years of professional training in child development and play-based learning. Teachers, having at the very least a Bachelor of Education degree, have more post-secondary academic background, understand the methodology of play, and bring experience with the Ontario school system curriculum for Kindergarten to Grade 8 and its reporting structure.

⁷ If there are fewer than 16 children in a classroom, there would only be a certified teacher, not an early childhood educator.

“The purpose of Full-Day Kindergarten in Ontario is to provide a strong foundation for learning in a safe and supportive environment ...”

In contrast, half-day Kindergarten in Ontario was taught by a single teacher with a Bachelor of Education and a Primary/Junior specialization. The curriculum featured acquisition of skills with some time for play. Curriculum expectations were met in a shorter time period (typically two and a half hours per day, five days a week). Literacy and numeracy skills were often taught directly rather than through play. The typical class size was about 23 students.

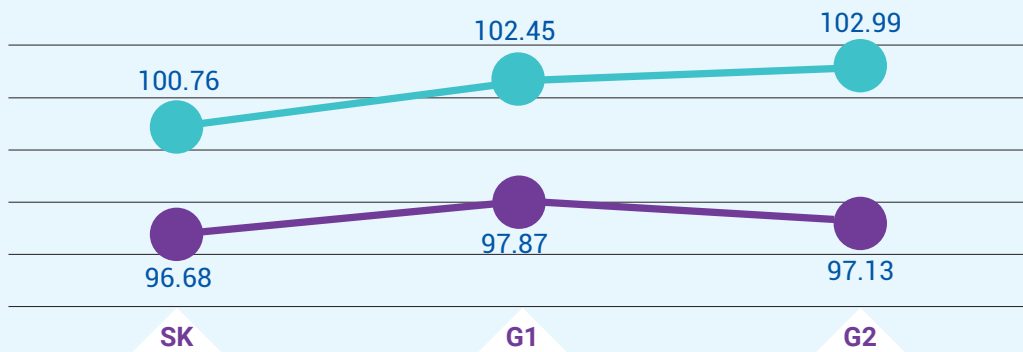
The charts below show the basic results from Pelletier and Corter's work. They show the average test results, on the tests described above, for those children who attended Ontario's Full-Day Kindergarten compared to those who attended only half-day programs. Potential confounding factors were held constant. The cognitive tests assessed receptive vocabulary, early reading ability, early mathematics (numerical concepts and relationships) and early writing skills. All tests were designed for children of Kindergarten age. Non-cognitive tests included Head-toes-knees-shoulders (a test of aspects of self-regulation) and a measure of social experience based on a drawing exercise.

Each chart shows two lines. The purple line, in the lower position on each chart, reflects the results associated with half-day Kindergarten. The turquoise or light blue line, in the higher position on each chart, reflects the results associated with the Full-Day Kindergarten program. All children received the cognitive and non-cognitive tests in the spring term of Senior Kindergarten, the spring term of Grade 1 and the spring term of Grade 2.

These are the main results from the Pelletier and Corter study, displayed diagrammatically. They are the adjusted marginal means, in other words, the effects of full-day versus half-day Kindergarten programs after adjusting for other influences on children's experience in Kindergarten. These other influences include child age, mother's education, English as a first language, and socioeconomic status of the neighbourhood.

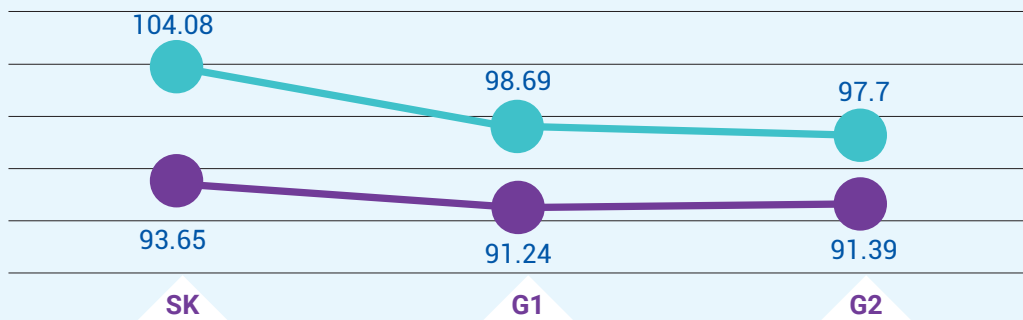
Vocabulary

Scores by Grade Level for HDK and FDK



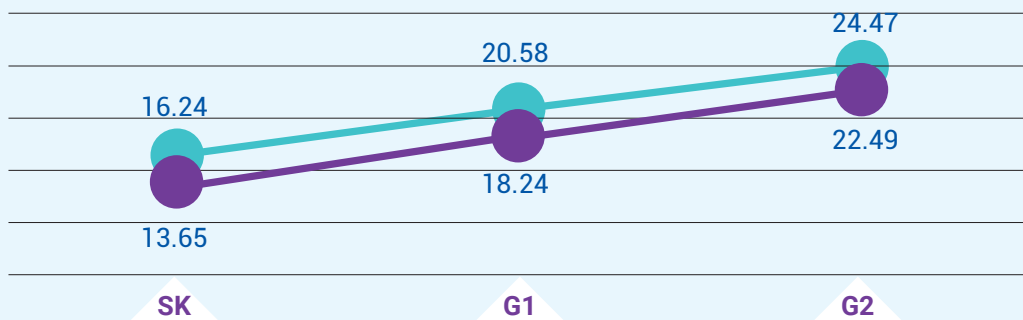
Reading

Scores by Grade Level for HDK and FDK



Mathematics

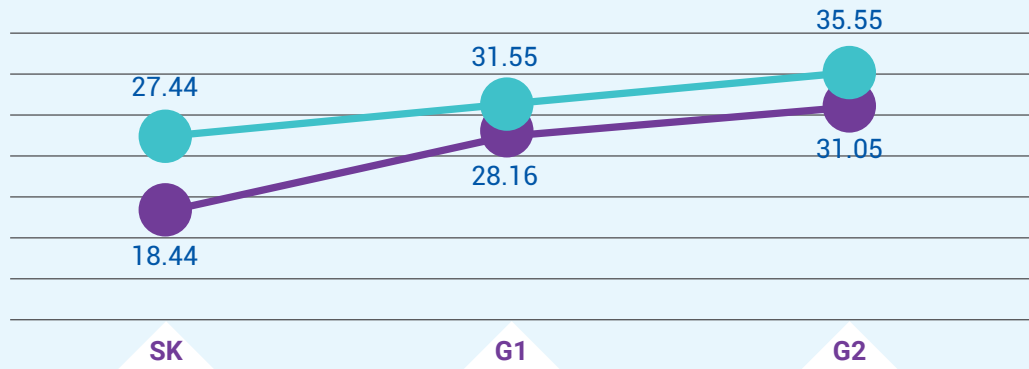
Scores by Grade Level for HDK and FDK



—●— HDK —●— FDK

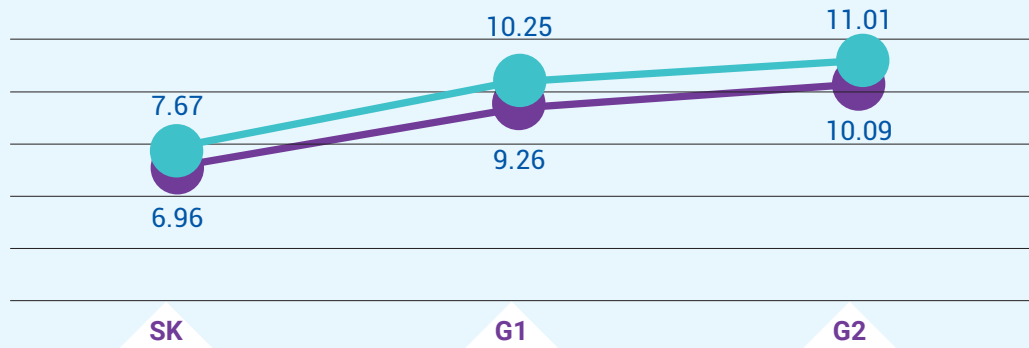
Self-Regulation

by Grade Level for HDK and FDK



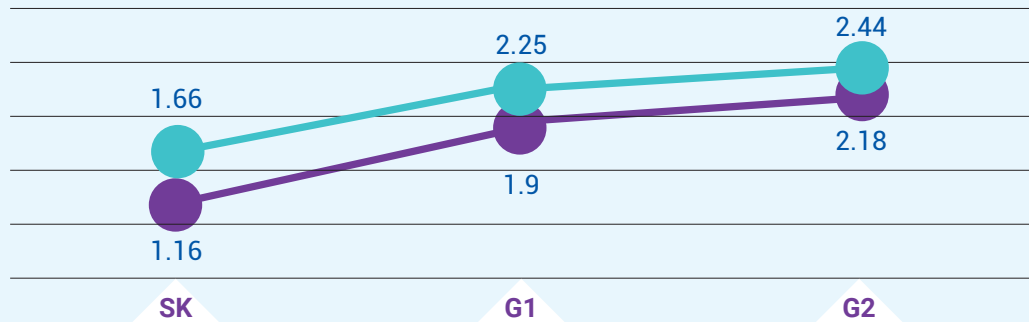
Writing

Scores by Grade Level for HDK and FDK



Drawing

Scores by Grade Level for HDK and FDK



● HDK ● FDK

Each of these diagrams shows Full-Day Kindergarten children scoring better than the children in half-day programs. That's true at the end of Full Day Kindergarten, Grade 1 and Grade 2. That's true for vocabulary,⁸ reading and number knowledge (mathematics). And it's true for a measure of self-regulation (the ability of the child to regulate and control instinctual behaviour). Full-Day Kindergarten children are also ahead in writing ability and in a drawing exercise (considered to be a measure of self-expression). In some of these measures, there is evidence of a narrowing of differences as children progress in school, but there is still a clear Full-Day Kindergarten advantage in Grade 2.

Not all of the sample had reached Grade 3 by the time the Pelletier and Corter study was written. There is some evidence about results on standardized tests held in Ontario at Grade 3, but the sample is small. These are tests of reading, writing and mathematics co-ordinated by the Education Quality and Accountability Office (EQAO). Pelletier and Corter found that Full-Day Kindergarten children were significantly more likely to reach provincial expectations in reading at Grade 3. The results for writing were not statistically significant. The results for mathematics gave an advantage to Full-Day Kindergarten students that was just short of conventional statistical significance in this small sample.

The play- and inquiry-based curriculum is a particular strength of Ontario's Kindergarten approach. It is worth noting that Kindergarten in Ontario and the United States are heading in different directions. As Daphna Bassok and her co-authors from the University of Virginia make clear (Bassok et al., 2016), Kindergarten in the U.S. is becoming more academic. They compared U.S. public school Kindergartens in 1998 and 2010 and found a heightened focus on academic skills and a reduction in opportunities for children to play. In U.S. Kindergartens there is more teacher-directed instruction and substantially less time for art, music, science and child-selected activities.

8 The result for vocabulary is statistically significant only for children with English as a first language.

This trend in the U.S. is confirmed by Erika Christakis (2016) in an article in *The Atlantic* aptly titled "The New Preschool is Crushing Kids." Christakis writes: "Much greater portions of the day are now spent on what's called 'seat work' (a term that probably doesn't need any exposition) and a form of tightly scripted teaching known as direct instruction, formerly used mainly in the older grades, in which a teacher carefully controls the content and pacing of what a child is supposed to learn." (Christakis, 2016)

In Ontario, in particular, there is clarity that the best way to ensure the long-term academic success of students is to emphasize motivation and engagement in the context of play- and inquiry-based learning in Kindergarten. This accords with the best scientific evidence we have about how children learn in Kindergarten. "Full-day Kindergarten's rich and secure environments are essential for the deep play where children learn to negotiate, consider the feelings of others and contribute to the group." (McCuaig, 2019) The Ontario Full-Day Kindergarten model is of excellent design. It has the key important elements: a curriculum emphasizing acquisition of important cognitive and non-cognitive skills through involvement in play-based activities; a team of a teacher and a designated early childhood educator with subject matter and child development knowledge; and a relatively small effective class size with additional support from principals and special education resources.



The remaining problems are ones of incomplete implementation. Kathryn Underwood and her colleagues from Ryerson University's School of Early Childhood Studies have written (Underwood, Di Santo, Valeo and Langford, 2016) that the main model of teacher–educator co-operation in Ontario's Kindergartens in 2016 was what they call “one teach/one assist.” In other words, a relatively hierarchical classroom partnership. This form of co-teaching in the class does not take full advantage of the complementary skills of the two teacher–educators. The authors suggest that more collaborative planning time as a team and appropriate professional development will help to improve Kindergarten partnerships.

Rachel Langford and colleagues, in another article evaluating the Ontario Kindergarten system (Langford et al., 2018) found “evidence of inequalities and a lack of complementarity in the roles and responsibilities of the educators in the FDK classrooms” (p. 2). As Monica McGlynn-Stewart and Kimberley Bezaire, Professors at George Brown College, observe, the building of an educator team in Kindergarten is a work in progress (McGlynn-Stewart and Bezaire, 2015).

Professor Janette Pelletier agrees, based on interviews with teachers and ECEs. There are “perceptions of hierarchy and difficulties with the staff team. The greatest challenges to the FDK model, according to ECEs and Kindergarten teachers related to the staff team. Program issues, time for meetings and scheduling were also reported often.” (Pelletier, 2014, p. 17)



However, the most recent work by Janette Pelletier, along with her colleague, Christina Moore, shows, over time, a more equal sharing of tasks between the teachers and educators in the Kindergartens that were part of her longitudinal study (Pelletier and Moore, 2019). It is important to assess whether this welcome progress is true across the province.

Another implementation issue is space. There are some physical environments where the play-based model is not working ideally. A play-based learning environment can require more physical space than a teacher-directed learning model, and there are some classrooms that are too small for the number of children enrolled.

Overall, Ontario's Full-Day Kindergarten is very good and getting better. There is some work still to be done to fully implement its vision. Both teachers and early childhood educators need to continue to work on their abilities to get the most out of play- and inquiry-based learning. Both teachers and early childhood educators need to continue to work on the collaborative model. It is these types of improvements in Ontario's Kindergarten system that should be supported with time for collaboration and professional learning for the team in order to build and enrich their partnership.



G Full-Day Kindergarten is Often Where Children's Educational Needs are First Discovered and Addressed

A considerable number of children in Ontario schools have special educational needs. In 2017–18, according to Ontario Ministry of Education data, 15.2 per cent of children in elementary education (i.e., Kindergarten to Grade 8) were receiving special education programs or services. In Ontario Kindergartens, according to information available through the administration of the Early Development Instrument (EDI), nearly 12 per cent of children have special needs (Philpott et al., 2019).

The EDI is a questionnaire, completed by teachers in Kindergarten, that assesses a child's developmental profile across five domains: physical health and well-being, emotional maturity, social competence, communication skills and general knowledge, and language and cognitive development. Children are considered vulnerable if they score below the tenth percentile for a particular domain, when benchmarked in comparison to a Canada-wide norm. According to the EDI for 2018 (Ontario Ministry of Education, 2019b), nearly 30 per cent of Ontario children in Senior Kindergarten that year were vulnerable in at least one of the five domains.

Children with special educational needs and their families are likely to be dramatically and negatively affected if Kindergarten is moved out of public schools and into private child care centres. Similarly, reforms that make class size larger or remove bachelor-educated teachers from Kindergarten classrooms are likely to be strongly negative for vulnerable children. The Ontario school system has invested much time and resources in developing systems for identifying special educational needs and providing special supportive educational services for those children who need them, at no cost to parents. Although there are also some special developmental supports provided through Ontario municipalities for children

in licensed child care, these are more difficult to access and less well resourced. And, of course, many families who have children with special needs are not able to access or afford licensed child care, whereas Kindergarten is both universal and free.

The discipline of special education traditionally views early identification and early intervention in relation to special needs as beginning at age six, when compulsory schooling begins. Professor David Philpott has been at the forefront of the study of special education in Canada for 38 years. He and his co-authors from the Faculty of Education at Memorial University of Newfoundland say that waiting until age six is waiting too long (Philpott et al., 2019). If we take the opportunity to identify special needs of children earlier and provide appropriate supports, the life trajectories of vulnerable children can be changed.

Philpott and his co-authors cite a U.S. meta-analysis (McCoy et al., 2017) that concludes that enrollment in quality early childhood education can reduce later participation in special education programs by more than eight per cent. This is found to save between \$8,000 and \$12,000 (U.S. dollars) annually per child in special education. The same preventive logic would apply to the potential effects of quality Kindergarten services in Ontario.



Recognizing the signs of delayed development in young children can be difficult for families and care providers, and without a sense of potential responses, these issues can remain unresolved and become more complex over time. Furthermore, Ontario EDI data suggest that, in recent years, there has been an increase in children who experience social-emotional vulnerability when they enter Kindergarten (Kulkarni et al., 2019).

The most common reasons for special educational needs are literacy/numeracy lags, language delays and behavioural problems. In fact, approximately 60 per cent of children receiving special education services do so due to lags in these three areas (Philpott et al., 2019, p.6). The literature on the impacts of both good-quality early childhood education and Kindergarten on children suggests that these services have effects in exactly the same areas: enhanced literacy/numeracy skills, enhanced language skills and stronger behavioural regulation. Further, special educational needs are more prevalent among children from low-income backgrounds; the effects of early childhood education and Kindergarten are strongest on children from precisely these backgrounds. So, providing services early in a child's life can be of key importance to those with special needs (Philpott et al., 2019; Kulkarni et al., 2019). As David Philpott writes, "participation in quality early childhood education programs significantly prevents special education placement and lowers the intensity of supports required for children with exceptionalities." (Philpott, 2019)



The EDI indicates that, of the children with special needs in Ontario Kindergartens, over 90 per cent have speech impairments, emotional/behavioural problems or a learning disability. These are what David Philpott and his colleagues call "highly preventive areas" (Philpott et al., 2019, p.7). In other words, they could be responsive to early interventions and supports of one kind or another. Pelletier and Corter's research (2019) concludes that Ontario's Full-Day Kindergarten provides extra support to children's development in vocabulary, self-regulation, language and numbers. In other words, Ontario's Full-Day Kindergarten saves later costs on special educational services.

Recent research supports Philpott's emphasis on high-quality early childhood education and care (ECEC) as a potentially preventive experience for children at risk. Edward Melhuish, from University of Oxford, finds that quality early childhood programs decrease the risk of special educational needs (SEN) in later years: "...children who had high-quality (or effective) ECEC showed a 40–60% lower level of risk for cognitive SEN... [and] a 10–30% lower risk of developing socio-emotional SEN" (Melhuish et al., 2019). Pelletier's new research (Pelletier and Fesseha, 2019) confirms with Ontario data that children in Full-Day Kindergarten are at lower risk of needing special educational services in the future than children in half-day programs.

Special needs services are available in Ontario Kindergartens and a significant portion of educational budgets are spent providing individualized supports to children with a range of needs. All students require support from teachers, classmates, family and friends in order to thrive and to fully benefit from their school experiences. Some students have special needs that require supports beyond those ordinarily received in the school setting. In Ontario, students who have behavioural, communication, intellectual, physical or multiple exceptionalities may have educational needs that cannot be met through regular instructional and assessment practices. These needs may be met through accommodations and/or an educational program that is modified above or below the age-appropriate grade level expectations for a particular subject or course. Such students may be formally identified as exceptional pupils. The Ministry sets out definitions of exceptionalities that must be used by school boards after determining that a student is an "exceptional pupil."

All students formally identified as exceptional by an Identification, Placement and Review Committee (IPRC) must have access to an education that will enable them to develop the knowledge and skills they need to participate in their communities. The Education Act requires school boards to provide special education programs and special education services for its exceptional pupils. In the 2018–19 school year (the most recent figures available, Ontario Ministry of Education, 2020a) more than 88,000 elementary students were identified by an IPRC as exceptional pupils. A further 126,000 students who were not formally identified were provided with special education programs and services.

School boards must develop an Individual Education Plan (IEP) for every student identified as exceptional. An IEP is a written plan describing the special education program and/or services required by a particular student. It is based on a thorough assessment of the student's strengths and needs that affect the student's ability to both learn and demonstrate learning. School boards also have the discretion to develop an IEP for students who have not been formally identified as exceptional but who are receiving special education programs and/or special education services.

In contrast, in no province or territory is there an entitlement to service or inclusion for children with special educational needs in licensed early childhood education (ECE) programs. Inclusive ECE is recognized as a best practice, but it is apparently not widely available. Philpott and co-authors (Philpott et al., 2019) indicate that most jurisdictions have written policy but poor data on inclusive services in child care. The 2017 Multilateral Early Learning and Child Care Framework agreement among the provinces and territories states that “[g]overnments agree to work together over time to achieve broad long-term goals for early learning and child care systems that are: high-quality; accessible, affordable and flexible; and inclusive” (p. 2). Further, the agreement clarifies that “[i]nclusive early learning and child care systems respect and value diversity, which could include but is not limited to: (a) Children and families who are experiencing vulnerability, (b) Children with varying abilities” (p. 2). Making ECE services fully inclusive is a long-term goal, while with Kindergarten it is a short-term reality.



“The Ontario Ministry of Education does provide Special Needs Resourcing funds to service local government entities and First Nations to support the inclusion of children with special educational needs in licensed ECE programs and authorized recreation programs, by acquiring the services of a resource teacher, consultant or supplemental staff where necessary, and providing training for staff (Ontario Ministry of Education, 2019b).” A total of 31,483 children were funded through Special Needs Resourcing between January 1 and December 31, 2018, the most recent year of data available (Ontario Ministry of Education, 2020b)

The type and level of service can vary depending on each child's needs, the local service model, and available resources. Resource consultants typically provide ECE staff with program accommodations, modification strategies or professional development, support for individualized support plans, developmental screeners and referral to community agencies, and information and resources for parents.

Despite progress in the provision of funding for special educational needs in licensed child care in Ontario, children with special needs would suffer if Kindergarten funding was cut, if Kindergarten class sizes became larger, if there was no longer a teacher in the classroom, or if Kindergarten services were privatized. Both for children with special educational needs and for other children, the supports that the current Kindergarten model provides work (largely) well.

H Increasing Class Size Will Lower Kindergarten Quality

There has been a great deal of research about the impact of class size in schools. Researchers have studied the effect of class size on classroom teaching, on children's abilities in the short term, and on children's later academic achievement, employment and various measures of life success. Some of the research focuses on class size in Kindergarten, some looks at later grades, and some at child-staff ratios in early childhood education. Looked at together, these various pieces of research can provide us a rounded picture of the importance of class size in Full-Day Kindergarten in Ontario.

In most jurisdictions, the meaning of class size is clear. In most jurisdictions, in Kindergarten and in later grades, there is only ever one teacher assigned to each classroom. Sometimes there is an untrained teacher's aide, often part-time, but only ever one person with teaching responsibilities. Ontario's Full-Day Kindergarten is different because there is a team of two educators—a certified teacher and a designated early childhood educator—in (virtually) every classroom.



This means that the research literature on class sizes in Kindergarten doesn't apply directly to our circumstances. Ontario has class sizes in Kindergarten that average 26 children in a class. That's pretty large. But, with two educators in each class, it's probably fair to say that the effective average class size is much smaller. We will have to consider how the research on class size applies in this unique Ontario context.

Nina Bascia, Professor at the Ontario Institute for Studies in Education at the University of Toronto, studied Ontario's Primary Class Size Reduction initiative for the Canadian Education Association and wrote about it in a recent report (Bascia, 2010). The policy reduced the size of primary classes (Grades 1, 2 and 3) from 23 or more students to 20 students or fewer over a four-year period (2004–08). The research team reviewed the literature, analyzed statistical data, conducted field research in eight Ontario school districts and surveyed parents.

Bascia concluded that "class size reduction can provide the environment in which teachers can interact with individual students more frequently and use a greater variety of instructional strategies, create more opportunities for higher-order co-construction of meaning by students, and interact more frequently with other teachers and adults in support of classroom teaching.

The evidence suggests that students learn more, are more engaged, and are less disruptive. Parents of children in smaller classes perceive improvements in their children's school experiences." (Bascia, 2010, p. 19)

As we have mentioned earlier, one of the best-known studies of the impact of class size is one that focuses on Kindergarten and the early years of school: the Tennessee STAR (Student/Teacher Achievement Ratio) study. This was a large study (11,600 students in total) where students were randomly assigned to different sized classes in Kindergarten and the first three years of school. Larger Kindergarten classes had 20 students; smaller ones had 15. The data from this very important experiment has been analyzed by many researchers and linked with other data to determine a range of impacts that class size and quality have had on children's lives.



Alan Krueger was the James Madison Professor of Political Economy at Princeton University and head of the Council of Economic Advisors under President Obama. His study of the Tennessee STAR experiment (Krueger, 1999) concluded that attending a small class in Kindergarten typically resulted in an increased score of four percentage points on standardized tests. He found that this test score advantage increased by about one percentage point in each subsequent year in a small class. He also found that class size had a larger effect for students with an ethnic or racial minority background, and in general for children from lower-income families.

Diane Schanzenbach is professor of education and social policy at Northwestern University's School of Education and Social Policy in Illinois. In an overview of research (Schanzenbach, 2006) based on Project STAR, she finds that there is evidence of a persistent positive impact of small-class assignment in the early years that is statistically significant through eighth grade. The magnitude of the gain in these later grades is one-third to one-half the size observed while the students were in Kindergarten through Grade 3. When the results are disaggregated, the long-term impact appears to remain stronger with Black and lower-income students ("free-lunch-eligible" students in Schanzenbach's study) than with more advantaged students.

Two Canadian economists from Queen's University, Weili Ding and Stephen Lehrer, recently re-analyzed the Tennessee STAR data (Ding and Lehrer, 2010). Their study confirmed benefits from attending small classes in all cognitive subject areas in Kindergarten and first grade. They did not find additional benefits from continuous treatment after Kindergarten and Grade 1.

Steffen Müller is Professor at the Otto von Guericke University Magdeburg and head of the Department of Structural Change and Productivity at the Halle Institute for Economic Research in Germany. Looking again at the Tennessee STAR data (Müller, 2013), he found an interaction between class size and teacher experience. More experienced teachers were better able to take full advantage of smaller class size. Class size matters, but teacher characteristics matter too.

The SAGE program in Wisconsin (Student Achievement Guarantee in Education) was a pilot program for children in Kindergarten to Grade 3 beginning in 1996–97. It had four components, but researchers agree that the main one was a reduction in the pupil–teacher ratio to 15 students per teacher (down from between 21 to 25 students per teacher). This initiative was targeted to schools with a high proportion of students from low-income families, i.e., schools with 30 per cent or more of their students coming from families living below the poverty level. Participating schools received \$2,000 per low-income student to fund the educational reforms. Some of the classrooms modelled the option of having two trained teachers per classroom (so a ratio of 30:2 rather than 15:1).

The results at the end of Grade 1 of the pilot program (Molnar et al., 1999) were significantly positive for children's academic outcomes. In tests on reading, language arts and mathematics (the Comprehensive Test of Basic Skills), students in smaller classes showed improvements of between 0.1 and 0.2 standard deviations relative to results in a group of comparison schools. An increase in individualized instruction was found to be among the most effective changes brought about with a smaller class size.

In a study with 49 teachers and 898 students, Christian Brühwiler, Professor at the St. Gallen University of Teacher Education in Switzerland, and Peter Blatchford, Professor at University College London (2011), looked at impacts of class size in primary and secondary school classrooms in England and Wales. In particular, they examined effects of class size on two key processes: pupil classroom engagement and teacher–pupil interactions. The authors found that smaller classes led to better academic learning progress, better knowledge of students by teachers and better classroom process. They conclude that both class size and teacher quality are independently important to learning.

Christopher Jepsen, from the University of Kentucky, and Steven Rivkin, from Amherst College, study this same interaction between class size and teacher quality in the context of California's very ambitious class size reduction program (Jepsen and Rivkin, 2009). In the summer of 1996, California enacted the most ambitious state-level education reform in U.S. history. The class-size-reduction program reduced Kindergarten through Grade 3 class sizes across the state by roughly ten students per class, from 30 down to 20. The reform created 25,000 new teaching positions in its first two years. Unfortunately, many of these positions were filled by teachers without certification or prior teaching experience.

The results show that smaller classes in California raised mathematics and reading achievement, on average, by roughly 0.10 standard deviations in mathematics and 0.06 in reading. However, they also show that reduced class size did not always improve student results. If classrooms in a school district had a larger proportion of inexperienced teachers or teachers without full certification, this was found to lessen the benefits of being in smaller classes. This was particularly true in schools with higher numbers of low-income students and students from minority backgrounds.

Keith Zvoch is an Associate Professor in the Department of Educational Methodology, Policy and Leadership at the University of Oregon. Together with his co-authors (Zvoch, Reynolds and Parker, 2008), he collected literacy data on students to assess relationships between Kindergarten program



model (full-day versus half-day) and student literacy outcomes. Zvoch and his co-researchers used multilevel modelling techniques on data they collected on Kindergarteners in economically disadvantaged school contexts in a large school district in the southwestern United States. They found that students exposed to a full day of instruction had greater literacy growth than their peers in half-day classrooms. Further examination revealed that full-day Kindergartens were more effective in smaller class size environments.

Peter Frederiksson and his colleagues (Fredriksson, Öckert and Oosterbeek, 2016) study the effects of a maximum class size rule in Swedish schools. This is in the last three years of primary school, when children are aged 10 to 13. Fredriksson and his colleagues have found that high-income parents whose children face larger classes spend more time helping children with homework and are more likely to switch their children to another school. Low-income families are less likely to do either. This may partially explain why lower-income children are disproportionately negatively affected by larger class sizes.



In a second article (Fredriksson, Öckert and Oosterbeek, 2013), the same authors found that smaller class sizes are beneficial for cognitive and non-cognitive ability at age 13 and improve achievement at age 16. In the longer term, smaller classes have positive effects on completed education, wages and earnings at age 27 to 42. The estimated wage effect is large enough to pass a cost–benefit test.

Not all studies find positive effects of smaller classes at all grade levels. A recent study by Leuven and Løkken (2019) using Norwegian administrative data did not find long-term effects of smaller class sizes in compulsory school on outcomes out to age 48. However, the small classes that Leuven and Løkken studied did not result from a decision to improve educational experience by deliberately lowering class size (and amending curriculum and teaching practices to suit the smaller class size). They more likely were due to accidental enrolment factors. There is no reason to believe that accidental or incidental class size reductions will automatically improve educational experiences.

Eric Hanushek (1997) has similarly argued that teacher–pupil ratio generally has no effect. However, Alan Krueger (2003) has shown that Hanushek’s results are sensitive to how he weights the evidence provided by different studies, and that results of quantitative summaries of the literature (such as Hanushek, 1997) depend critically on whether studies are accorded equal weight. When each estimate is given equal weight, small class size is not systematically related to student achievement. However, some studies produce many estimates from the same underlying data. When each study (not each estimate) is weighted equally, class size and achievements are found to be systematically related. Note also that although Hanushek’s discussion of teacher–pupil ratio would seem to apply directly to the two-educator model, it does not. Hanushek’s teacher–pupil ratio is calculated system-wide, including itinerant and specialist teachers; it does not refer to the typical situation in any particular classroom.

The mechanisms by which smaller classes have positive impacts in Kindergarten and elementary grades have not been sufficiently addressed. Jeremy Finn is Professor of Educational Psychology in the Graduate School of Education, University at Buffalo. Together with his co-authors (Finn, Pannozzo and Achilles, 2003), Finn investigates this issue. Their article puts forward the hypothesis that when class sizes are reduced, major changes occur in students’ engagement in the classroom. Engagement is composed of learning behaviour and pro- and anti-social behaviour. Both types of behaviour are strongly related to academic performance. Finn and his colleagues use both theory and empirical findings to support their hypothesis.

Peter Blatchford is Professor in Psychology and Education at the University College London. Together with his co-authors (Blatchford, Bassett and Brown, 2011), he looked at the effects of class size on classroom interactions and pupil behaviour. The team made systematic observations on 686 pupils in 49 schools. At primary and secondary levels, smaller classes led to pupils receiving more individual attention from teachers and having more active interactions with them. Classroom engagement decreased in larger classes.

The message from many of these studies is that while class size is extraordinarily important in facilitating educational improvements, it is not, on its own, a silver bullet. As Bascia (2010) has noted, it is not just the what, it's the how: "[e]ffective implementation requires policies and procedures that take into account differences in student skills and supports and provide effective learning opportunities for diverse groups of students.... Quality classroom space, opportunities for teachers to work and plan together easily; opportunities for teachers to learn new instructional strategies; and instructional resources (both materials and human expertise) are all crucial." (p. 19)

Katherine Magnuson, Professor of Social Work at the University of Wisconsin–Madison, and co-authors (Bowne, Magnuson, Schindler, Duncan and Yoshikawa, 2017) examined research on the relationship between class size and child–teacher ratio in explaining program effects in early childhood education in the U.S. Both class size and child–teacher ratio showed nonlinear relationships with cognitive and achievement effect sizes. For child–teacher ratios of 7.5:1 and lower, the reduction of this ratio by one child per teacher predicted a positive effect size of 0.22 standard deviations. For class sizes 15 and smaller, one child fewer predicted an effect size on achievement of 0.10 standard deviations.

Experts agree that smaller class sizes, especially in Kindergarten, can be used to improve educational quality and children's learning. This includes providing more opportunities for quality adult–child interactions and ensuring the safety and well-being of children.



Lowering Teacher Education Qualifications Will Lower Kindergarten Quality

Does teacher education matter? Some Ontario politicians have mused about lowering the educational requirements in Kindergarten classrooms (Rushowy and Monsebraaten, 2019). Ontario's Kindergarten model is unique, so there is no research that directly estimates the impact of replacing a teacher–educator team with other staffing models with lesser levels of education. However, existing research provides important insights.

All researchers agree that teachers matter—a lot (e.g., Araujo et al., 2016; Chetty, Friedman and Rockoff, 2014; Hanushek and Rivkin, 2010; Mashburn et al., 2008). Stating their conclusions provocatively, Chetty and colleagues (Chetty, Friedman and Rockoff, 2014) conclude that the value of good teaching is so positive for children's futures that parents of children with a really good teacher should collectively be willing to pay that teacher up to \$200,000 per year to stay and teach their children. Less provocatively, they conclude that "the quality of teaching...is likely to have substantial economic and social benefits" (p. 2677). Eric Hanushek is the Paul and Jean Hanna Senior Fellow at the Hoover Institution of Stanford University and a recognized leader in the economic analysis of education issues. He and co-author Steven Rivkin, Professor of Economics at the University of Illinois at Chicago, estimated the value of a very good teacher (measured by the effect on children's futures) at over \$400,000 per year (Hanushek and Rivkin, 2012, p. 150).

“Experts agree that smaller class sizes, especially in Kindergarten, can be used to improve educational quality and children's learning.”

But what makes for a good teacher? How much does pre-service formal education matter? Research has come up with contradictory and confusing results. Much of the research does not actually deal with teachers in schools, because the requirement for an education-focused university degree is standard. Instead, much of the research focuses on U.S. pre-kindergartens or child care where there is more variation in educational backgrounds to study. It is unclear how this research applies to school-based kindergartens.

There is a considerable amount of research that seems to say that higher levels of teacher education (i.e., formal qualifications) will not translate directly into improved child outcomes. Eric Hanushek has concluded, in many articles (Hanushek, 1997, 2010, 2012), that observable teacher characteristics such as formal education are not decisive. David Blau, Professor Emeritus of Economics at Ohio State University, found teacher education had little impact on child care quality and children's outcomes (1997, 1999, 2000). Carollee Howes and her co-authors (Howes et al., 2008) found that higher-quality instruction mattered for children's academic outcomes in pre-Kindergarten in the U.S., but that teacher qualifications did not explain much of this variation. Ying-Chun Lin and Katherine Magnuson, both from the School of Social Work, University of Wisconsin–Madison, find few associations between teachers' education levels or ECE qualifications and observed classroom quality in child care centres (Lin and Magnuson, 2018). The exception is for teachers with neither post-secondary education nor ECE training, in which case classroom quality is significantly lower.

On the other hand, there is a lot of research that appears to support an opposite conclusion. For instance, Pamela Kelley, from the National Institute for Early Education Research in the U.S., and Gregory Camilli, Professor in the Graduate School of Education at Rutgers University, have done a meta-analysis of studies of teacher education in centre-based early childhood education programs (Kelley and Camilli, 2007). They concluded that results are "more positive when teachers have higher levels of educational attainment and in particular, a bachelor's degree." (p. 31)



A more recent meta-analysis (Manning et al., 2019) confirms this picture, concluding that "higher teacher qualifications are significantly correlated with higher quality ECEC environments" (p. 370). This mirrors another recent meta-analysis, based on findings from 22 European longitudinal studies (Ulferts and Anders, 2016). They found variations in staff qualifications were the main element of structural quality having a significant impact on child outcomes.

In a research project focused on Kindergartens and child care in four Canadian provinces, Laura Johnson and Julie Mathien (Johnson and Mathien, 1998) found that "the presence of trained staff was the most important predictor of quality in both child care and Kindergarten. Parents were firm in their conviction that trained staff are necessary." (p.4)

A similar picture emerges from the work of Raquel Bernal's work (Bernal, 2015), Professor of Economics in the Universidad de los Andes in Bogota, Colombia. An education program was gradually introduced in Colombia providing a degree in child development and care for existing child care workers. Using the gradual introduction to identify the effects, Bernal found that increased education meant that quality of care significantly increased, with a positive and significant effect on the health, cognitive development and socio-emotional development of children in care.

“The current Kindergarten model is an excellent one and is working well.”

Similarly, we could look at work by Bauchmüller and his colleagues in Denmark (Bauchmüller, Gørtz and Rasmussen, 2014). Using Danish administrative data on over 30,000 children, they found that children who attended preschools with a higher percentage of teachers trained as pedagogues (three and a half years of bachelor education) did significantly better in Danish language skills at the end of elementary school in ninth grade. Boys were found to benefit particularly.

We could also look at the range of successful demonstration projects/experiments in early childhood education to find that well-educated and trained teachers were an important part of the quality that produced child outcome results. James Heckman and his colleagues (Elango et al., 2015) have looked at the Perry Preschool Program, the Carolina Abecedarian Project, the Infant Health and Development Program, and the Early Training Project. They identify several factors leading to the long-term success of these projects, including having a curriculum that promotes “play-based and child-directed learning, emphasis on language development, and emphasis on developing non-cognitive and problem-solving skills” (p. 20). This finding is of special relevance to our current concerns: “[a]ll four programs had relatively educated staffs with some experience in education and high teacher-to-child ratios.” (p. 20)

The National Institute for Early Education Research in the U.S. has developed a set of benchmarks for quality in pre-Kindergartens and preschools (Friedman-Kraus et al., 2019). The third benchmark is that state policy requires that lead teachers in every classroom must have at least a bachelor’s degree. This follows recommendations from multiple studies by the Institute of Medicine and National Research Council of the National Academy of Science. According to the authors, this benchmark is important because the only programs that have produced large, persistent gains in children’s achievement have had well-qualified teachers.

Many of the studies of teacher education referenced above focus on pre-Kindergartens or preschools. Especially at age four in the U.S., there are a range of pre-Kindergarten programs in different states with different education requirements, including sometimes a bachelor’s degree. This has permitted academics to examine the impact of different educational requirements on quality and child outcomes for four-year-old children.

The chief statistical problem with these studies is known as “selection effects.” In other words, the samples of teachers being studied have biased relationships between teacher education and teacher ability due to self-selection. This is an important issue in an influential study by Diane Early and her colleagues (Early et al., 2007). This study analyzed data sets with information on characteristics of teachers of four-year-old children, with measures of classroom quality and academic outcomes.

Diane Early’s study found no consistent evidence that increased education requirements for pre-Kindergarten teachers would have any substantial impact on classroom quality or children’s academic gains. However, as the authors discuss, selection effects may have been important to the results of their study. What are these selection effects? Wage levels in pre-Kindergartens and similar programs in the U.S. are lower than the wages in public schools but higher than in child care centres. Early childhood teachers in pre-Kindergartens and similar programs tend, through selection, to be a combination of moderately capable bachelor-educated teachers who couldn’t get a public school job, and very capable college-educated teachers with experience in the field.

Under these circumstances, a statistical study of pre-Kindergartens will find little relationship between teacher education and teacher effectiveness. But this will be due to the special characteristics of the pre-Kindergarten sample. Selection effects are a very common problem in academic studies. Selection effects mean that the samples are not random. And if samples are not essentially random, then studies that do not adjust adequately for this non-randomness will get biased results.

This is the point made by the Ontario Institute for Studies in Education's Olesya Falenchuk, Michal Perlman and Evelyn McMullen together with their co-authors (Falenchuk et al., 2017). Virtually all of the studies they include in their systematic review of teacher education and child outcomes in child care centres are observational in nature, subject to "the inherent biases of that research design." (p. 1)

So, what should we conclude about teacher education and Ontario Kindergartens? We have in Ontario a unique team concept of educators with different education levels, experiences and strengths. Early childhood educators are trained in child development, observation, documentation and play-based learning. They have knowledge of the social, emotional, physical and general cognitive development of young children. Certified teachers have training in the curriculum of the Ministry of Education and school board. A teacher assigned to Kindergarten is certified as a Primary Junior teacher, which means they are qualified to instruct children ranging from Kindergarten to Grade 6. Within this scope they understand learning expectations and assessment with a big-picture view on learning trajectories that extend into the upper years. The effective merger of these two distinct professionals, working collaboratively to deliver a single curriculum, is believed to connect high-quality early childhood practices and strong educational foundations in Ontario's Kindergarten classrooms. (Pelletier and Moore, 2019)

The current teacher-educator team model for Kindergarten is popular with Ontario's citizens. In a recent survey (Innovative Research Group, 2019) of Ontario residents (not just those with a child in Kindergarten), 71 per cent thought that the teacher-educator team was important to the success of Ontario Kindergartens (only 7 per cent disagreed). And, when asked whether there needed to be a certified teacher in the Kindergarten classroom full-time, 76 per cent of Ontario residents said yes (with only 7 per cent saying no).

Virtually all jurisdictions, in North America at least, require a bachelor-educated teacher in Kindergarten classrooms. All researchers agree that teachers matter enormously for what happens in classrooms. Virtually all quality assessment frameworks and regulatory frameworks for licensed child care presume that education and training matter for the provision of high-quality early childhood education services. And experience from successful early childhood education demonstration projects finds that well-educated teachers matter. And yet, studies based on observational samples often do not find statistical evidence that teacher education matters for child outcomes. This may be due to the weaknesses of observational studies.

To respond to conservative critics of Ontario Kindergartens, we do not need to know exactly what the link is between teacher education and child outcomes. What we need to know is whether getting rid of certified teachers with a Bachelor of Education degree will "enhance" quality and student outcomes in Ontario Kindergartens. For instance, would Ontario Kindergarten be better if it was delivered in a mix of for-profit and not-for-profit child care centres with their current educational requirements, staff-child ratios and so on (CBC News, 2019; Kan, 2019; and Rushowy and Monsebratten, 2019, suggested that this type of reform was being considered by the Ford Government).



Let's think about this proposition for a moment. What are the current staffing requirements in Ontario child care? The required staff-child ratio in child care centres for children of Kindergarten age (44 months to 68 months) is 1:13 (or 2:26), the same as in a current Kindergarten classroom. According to child care regulations, one staff member with each group of children must either be a member in good standing with the College of Early Childhood Educators⁹ (which implies that they must have a two-year diploma in early childhood education) or otherwise be approved by a Ministry of Education director. In other words, if Kindergarten were moved into child care centres at the existing regulatory requirements, there would be only one trained educator (a Registered Early Childhood Educator, or RECE) in each classroom of 26 pupils, as compared to one educator and one teacher in current full-day Kindergartens.

Further, there are currently not enough RECEs to fulfill existing requirements in child care centres in Ontario, let alone enough to provide Kindergarten. In 2018 (Ontario Ministry of Education, 2018), 38 per cent of all child care centres in Ontario were missing fully-trained early childhood educators. To be precise, in 2,066 centres across Ontario there was at least one, and perhaps many, child care workers without sufficient education to meet the regulatory requirements; they were only able to meet these requirements through what is called a director's approval. In general, these would be untrained or partly trained staff filling in a position that regulations require to be filled by an RECE with a two-year ECE diploma.

⁹ However, the Ontario Ministry of Education is currently trying to redefine "qualified employee", so that kindergarten-age child care rooms could operate without any staff having full ECE training (Ontario Coalition for Better Child Care, 2020)

“... a combination of a teacher and an early childhood educator would provide the perfect environment to enhance adult-child interactions ...”



So, what would this suggested reform amount to? We would get rid of Junior Kindergarten and Senior Kindergarten in local public schools, which consist of classes of 26 with a certified university-educated teacher and a designated college-educated early childhood educator. We would replace it with Kindergarten in child care centres, consisting of a class of 26 with (maybe) one RECE and one untrained staff member. With high probability, a considerable number of these child care centre/ Kindergarten classrooms would have two untrained staff members (one with director's approval) because of the extreme shortage of RECEs.

The area of children's development that could be most dramatically impacted by changes to the current staffing model in Full-Day Kindergarten is the quality of adult-child interactions. Ontario's unique Kindergarten model was designed with the understanding that a combination of a teacher and an early childhood educator would provide the perfect environment to enhance adult-child interactions and result in the intended outcomes. An early childhood educator who has qualifications in child development and knowledge of how to interact with children to provide a caring, nurturing environment for young children to grow and develop combined with a teacher who has qualifications in how to interact with children to ensure this environment enhances beneficial learning outcomes is at the heart of the Ontario Full-Day Kindergarten model. Tampering with this staffing model would risk losing many of the benefits that this model was built on. It is also certain that parents would object to the dismantling of Ontario's Full-Day Kindergarten program and would voice their opinions accordingly.

J Ontario's Full-Day Kindergarten is Delivered in a Cost-Effective Way

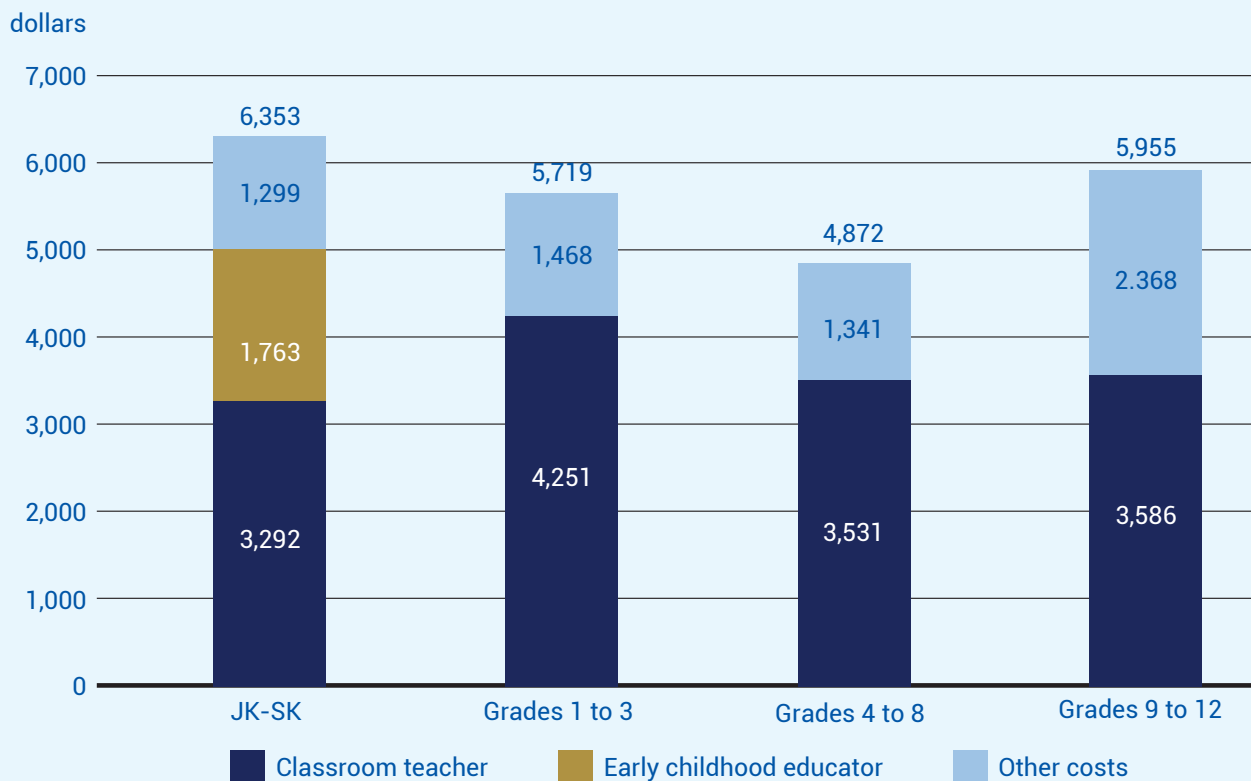
It is worth looking at the costs of Full-Day Kindergarten to reassure ourselves that this is both a good model of early education and one that we can afford.

The University of Ottawa's Institute of Fiscal Studies and Democracy (IFSD) became well known during the 2019 federal election when it did a fiscal credibility assessment of the platforms of all the political parties. The CEO of the Institute is Kevin Page, formerly Canada's first Parliamentary Budget Officer. The IFSD has been funded by the Province of Ontario to undertake applied research and promote student engagement in public finance and its intersection with public administration, politics and public policy.

In 2018, the Institute studied education spending in Ontario and wrote up the results in a document entitled "Education Spending in Ontario: From the Classroom to the Cabinet Table" (Bartlett and Reeves, 2018). For our purposes, what is really interesting in this report are estimates of the amount of education spending per student by grade level in 2018–19. For Junior and Senior Kindergarten, the spending per student is \$6,353 for the fiscal year. This is made up of \$3,292 of spending on the labour costs of Kindergarten teachers, \$1,763 of labour costs of early childhood educators and \$1,299 of other costs. The chart below (a reproduction of Chart 3 from that publication) shows the amount of spending per student at different grade levels for elementary and secondary education.

After some more discussion about what these numbers include and do not include, we would like to compare the cost of Kindergarten per student in 2019–20 to the cost of Kindergarten back when it was half-day only (2009–10), using the same methods as used by the Institute for Fiscal Studies and Democracy.

Chart 3: 2018-2019 Per Student Ontario Education Spending



Sources: Government of Ontario, Institute of Fiscal Studies and Democracy.

What do these expenditure-per-student numbers include and not include? These numbers come from the Pupil Foundation Grant that is the basic funding mechanism generating school services in Ontario. It reflects the “in-classroom costs” of public education (Bartlett and Reeves, 2018). In 2019–20, the Pupil Foundation Grant amounted to \$10.6 billion. This grant funds classroom staffing at benchmark salary and benefit rates for both certified teachers and designated early childhood educators (including preparation time). The grant amount also covers library services, classroom consultants, supply teachers, education assistants, professional and para-professional support services, textbooks and learning materials and supplies, classroom computers, and elementary supervision. Not included are the amounts from the School Foundation Grant and the Special Purpose Grants. So, the figures do not include the government contributions to special education, student transportation, school facility operations and renewal, or teacher and staff pensions. Nor does the amount include the supplements to teacher and educator wages that are based on extra qualifications and extra experience beyond benchmark levels. In Ontario’s education system, these are funded separately. Nonetheless, the

majority of per-student costs that can readily be allocated to particular grade levels are included in the chart above (see Ontario Ministry of Education, 2020a, for more details).

It would be very nice to have an exact comparable figure for the amount of per-student expenditure at the Kindergarten level for 2009–10, because in that year Ontario only had half-day Kindergarten. The difference between these two figures would give us the extra per-student expenditure due to the implementation of Full-Day Kindergarten. Unfortunately, things are not quite this simple.

Back in 2009–10, the Ministry’s per-student figures were not broken down so finely. In fact, all of elementary education, from Kindergarten through Grade 8, was lumped together. So, we could see the per-student expenditure on all of elementary education, but this is not precise enough.

Things are somewhat more promising in 2010–11. Now, we see per-student expenditure for Kindergarten through Grade 3, with another figure for Grade 4 through Grade 8. We show numbers in the charts below, and then we draw conclusions from the comparisons.



Current Dollars

Per-Student Educational Expenses by Grade Level in Ontario in Various Years

	2010–2011	2019–2020	% change from 2010–2011
Kindergarten JK/SK		\$6,275	
Grades 1–3		\$5,766	
Kindergarten–Grade 3	\$5,328	\$5,962*	+ 11.9%

*This figure calculated as a weighted average of above figures, using enrollment weightings from Quick Education Facts.

Constant (2019) Dollars

Per-Student Educational Expenses by Grade Level in Ontario in Various Years

	2010–2011	2019–2020	% change from 2010–2011
Kindergarten JK/SK		\$6,275	
Grades 1–3		\$5,766	
Kindergarten–Grade 3	\$6,185	\$5,962*	– 3.6%

*This figure calculated as a weighted average of above figures, using enrollment weightings from Quick Education Facts.

The figures show that, once inflation is discounted, the 2019–20 per-student spending for Kindergarten to Grade 3 is virtually the same as in 2010–11 (i.e., slightly lower). In other words, per-student spending was flat over this period.

But how is that possible? This is the period when Full-Day Kindergarten is phased in, when four and five-year-old students started to double the amount of time they spend in school. This is a period when many more Kindergarten teachers and many early childhood educators were hired. How is it possible that per-student spending in Kindergarten does not appear to have risen in real terms?

The answer is that these figures in the charts above are educational spending per full-time-equivalent student. In 2010–11, each Kindergarten student would be counted as half, so the sum of spending on two half-day Kindergarten students would be the full-time-equivalent amount. In 2019–20, each Kindergarten student would be counted as full.

Spending per full-time-equivalent student does not change in real terms over this period. In other words, a Kindergarten program that is twice as long each day is being delivered for just about exactly twice as much money per child. And this is true even with a teacher and early childhood educator in a class of 26 (average) instead of one teacher in a class of 20 (maximum). Ontario's current model is much more appropriate for the delivery of a play- and inquiry-based curriculum. Arguably, the quality of Kindergarten is substantially improved, but for the same classroom cost per full-time-equivalent student. In other words, the Full-Day Kindergarten reforms have brought in a very cost-effective early years program. There is no evidence here that costs and expenditures are out of control in Full-Day Kindergarten. Quite the contrary. Despite enormous changes to the program over time, it is being delivered at essentially the same cost per full-time-equivalent student as when Kindergarten was half-day.



Conclusion

Our conclusion is that Ontario's model of Full-Day Kindergarten is a success story. The play- and inquiry-based curriculum is flexible, age-appropriate education. The complementary skills of the classroom team of a certified university-educated teacher and a designated early childhood educator enhance the possibilities of small group work and individualized attention to student needs, which is crucial to quality experiences in Kindergarten. At the same time, the per-student cost of Full-Day Kindergarten is reasonable and has proven to be stable through time.

“ Ontario’s model of Full-Day Kindergarten is a success story. The play- and inquiry- based curriculum is flexible, age- appropriate education. ”

The evidence so far on children's cognitive and social-emotional development in Full-Day Kindergarten is strongly positive. The existing research gives no basis for believing that expanded class size in Kindergarten or a teaching team without a certified teacher would enhance children's educational experiences. There are strong reasons to believe that future needs for special education are being reduced through Ontario's high-quality Kindergartens.

It is still early days in the development of Ontario's Kindergarten model, so there is room for improvement of relationships, preparation and communication. The priority is to make Ontario's Full-Day Kindergarten model fulfill all of its promise, while accepting and celebrating its fundamentally successful design.

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