

Effective teaching ensures the steady progress of all students, regardless of their starting point. Information about the early development of children who are entering the school system can provide important insights on how to structure programs and supports that will give all students the best possible start.

Starting Early: Teaching, Learning and Assessment

Linking early-childhood development with academic outcomes

By Ruth C. Calman, for the Education Quality and Accountability Office

EQAO Research

EQAO undertakes research for two main purposes:

- to maintain best-of-class practices and to ensure that the agency remains at the forefront of large-scale assessment and
- to promote the use of EQAO data for improved student achievement through the investigation of means to inform policy directions and decisions made by educators, parents and the government.

EQAO research projects delve into the factors that influence student achievement and education quality, and examine the statistical and psychometric processes that result in high-quality assessment data.

Research has shown that starting early can change developmental trajectories for our youngest children and break intergenerational cycles of illiteracy, poverty, social isolation, and poor health.³

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PURPOSE

This bulletin presents information and insights obtained from a research study in which EQAO linked students' Early Development Instrument¹ (EDI) assessment results in kindergarten to their provincial reading, writing and mathematics assessment results in Grade 3.

BACKGROUND

Since 2004, the Offord Centre at McMaster University has been measuring student readiness for school across Ontario. Kindergarten teachers have completed the EDI to assess children on five developmental domains: *physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication and general knowledge*. Results of the assessments, administered in each school once every three years, have been provided to individual schools or school boards, in addition to being used to examine student readiness within communities and at the provincial level.

For the past two years, with a view toward providing schools with information to assist in improvement-planning efforts, EQAO has been working in partnership with researchers from the Offord Centre to gain an enhanced understanding of the relationship between early-childhood development and the consequent pathways involved in student learning and achievement.

Initial collaborative analyses have

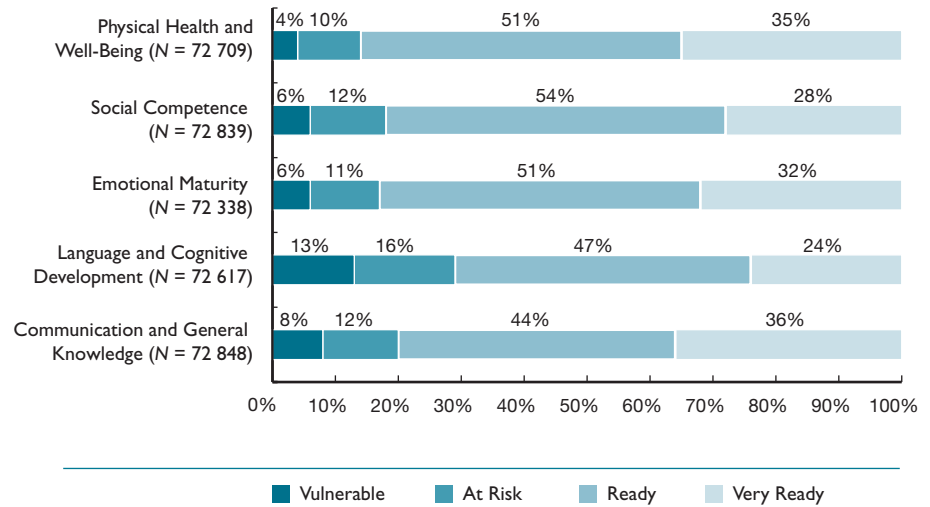
- provided a picture of the extent to which there are children who are *vulnerable*² or *at risk* upon entering kindergarten and the particular areas of development that present the greatest challenge;
- demonstrated the importance of giving early and sustained attention, particularly to children who are *vulnerable* or *at risk* upon school entry, since the early years of school provide the best opportunity to alter the academic trajectory of these students; and
- given some indication of the factors that influence the academic achievement of primary school students.



The following provides an overview of what the EQAO-Offord Centre collaborative analyses have revealed thus far for Ontario.⁴

EDI INFORMATION ABOUT ONTARIO KINDERGARTEN STUDENTS

Student Readiness Based on EDI Scores in Five Domains



Awareness of the greater incidence of vulnerability among boys and younger students serves as a reminder to pay particular attention to the development of these groups of students. Indeed, regular reviews of EDI data for children in their community may provide educators with useful insights into the strengths and challenges of students as they enter the school system. Early assessment of all kindergarten students informs individualized learning supports.

The data support the current school practice of providing extra assistance to English language learners and students with special education needs.

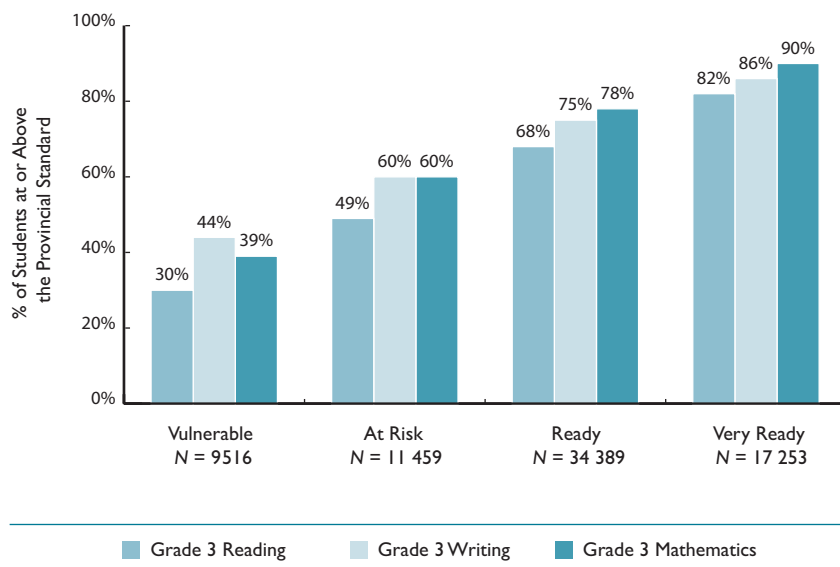
- Between 14% and 29% of students were in the *vulnerable* or *at risk* categories across the five EDI domains. The domain of *language and cognitive development* had the largest percentage of students in the *vulnerable* and *at risk* categories.
- Further analyses show that there were more male than female kindergarten students in the *vulnerable* and *at risk* categories across the five domains.
- There were also higher proportions of younger students in the *vulnerable* and *at risk* categories across the five domains (age comparisons were based on birth quarter—e.g., those born between January and March versus those born between October and December).
- English language learners were more likely to fall into the *vulnerable* or *at risk* groups than English-speaking students.
- Approximately four out of five students designated as having special education needs in Grade 3 had been assessed in kindergarten as being *vulnerable* or *at risk* in one or more of the five EDI domains.⁵

TRACKING ONTARIO STUDENT PERFORMANCE FROM KINDERGARTEN TO GRADE 3

- Students with low EDI scores—i.e., those in the *vulnerable* or *at risk* groups—were much less likely to achieve the provincial standard on the Grade 3 EQAO reading, writing and mathematics assessment than those

with high EDI scores—i.e., those students deemed to be *ready* or *very ready* in kindergarten. This was true for each of the five domains. The graph below exemplifies the relationship between EDI scores in the domain of *language and cognitive development* and student achievement of the provincial standard in reading, writing and mathematics in Grade 3.

EDI Language and Cognitive Development Domain and EQAO Achievement Results



- As evidenced in the graph, many students in the *vulnerable* category for *language and cognitive development* in kindergarten “defied the odds” and were able to reach the provincial standard in Grade 3—30% achieved the standard in reading, 44% achieved it in writing and 39% achieved it in mathematics. An even larger proportion of those deemed *at risk* in this domain, 49–60%, achieved the provincial standard in Grade 3. The data suggest that the supports and interventions that were in place for these two groups of children during their primary school years allowed them to address early challenges and proceed on a positive academic trajectory.

Early interventions can make substantial contributions to the academic skills of young children ... there is plenty of room for children to defy the odds, and many do.⁶

- Additional analyses of all five EDI domains indicate that not all students who had been rated “ready” in kindergarten met the provincial standards in Grade 3. Of students who had been “on track” in kindergarten (i.e., in the *ready* or *very ready* category for all five EDI domains), 16% did not meet the Grade 3 provincial standard in mathematics, 19% did not meet the standard in writing, and 25% did not meet the standard in reading.

The research points to the need for early assessment, support and intervention for *vulnerable* and *at risk* students in kindergarten, if they are to close the learning gap and achieve the provincial standard in Grade 3. EDI assessment data are available to assist in the process by supplementing other forms of in-school teacher assessment.

Readiness for school does not guarantee academic achievement. Sustained attention, ongoing assessment and support are required for all students.

The data confirm the importance of communicating to parents the need to ensure regular school attendance, right from the beginning of kindergarten.

Children who begin in a new school will benefit from transition plans to ensure that their progress is well monitored and that support is provided as required.

Differentiated instruction ensures that students are provided with the opportunity to learn at a pace congruent with their developmental stage and progress. While this is of benefit to all students, it is particularly important for the student groups at greater risk of not meeting the curriculum expectations, comprising boys and younger students.

Absenteeism in kindergarten, student mobility, gender and age were all identified as factors associated with academic achievement:

- **Absenteeism:** Longitudinal analysis suggests that patterns of poor school attendance, which are associated with poor school achievement, begin as early as kindergarten.
- **Moving to a New School:** Students who switched schools between kindergarten and Grade 3 were less likely to achieve the provincial standard on EQAO's primary-division assessment.
- **Gender:** The gender gap observed on the EDI domains in kindergarten persists insofar as females outperform males on EQAO student-achievement measures in reading and writing in both Grades 3 and 6. This gender gap has been observed since the inception of EQAO assessments but appears to be gradually narrowing, as evidenced in the last three years of Grade 3 EQAO results.
- **Age:** The age gap favouring older students was also shown to persist insofar as the proportion of older students in a grade who achieved the provincial standard was larger than that of younger students, in Grade 3 and even in Grade 6. This pattern is not unique to Ontario students: a study recently released by British Columbia's ministry of education pointed to an age gap favouring older students persisting through to the end of high school.⁷

Primary school educators face both a considerable professional challenge as well as a remarkable opportunity to make a substantive difference in the lives of their young students. In the foregoing, we have highlighted some research and associated implications that educators of young children may wish to reflect on. Following are some questions for you to consider in determining possible actions for your school or teaching practices.

¹ Janus, M., Brinkman, S., Duku, E., Hertzman, C., Santos, R., Sayers, & M. Schroeder, J. (2007). *The Early Development Instrument: A population-based measure for communities: A handbook on development, properties, and use*. Hamilton, ON: Offord Centre for Child Studies. Retrieved from http://www.offordcentre.com/readiness/pubs/2007_12_FINAL.EDI.HANDBOOK.pdf

² In establishing baseline data for the EDI, students who scored in the lowest 10th percentile on one or more domains were assigned the designation *vulnerable*. Children between the 10th and 25th percentile were considered *at risk*. Students who scored between the 25th and 75th percentile were designated *ready* and those who scored beyond the 75th percentile were designated *very ready*.

³ Pascal, C. E. (2009). *With our best future in mind: Implementing early learning in Ontario*. Toronto: Queen's Printer.

⁴ Collaborative analyses referenced in this report were based on a matched EQAO/EDI data sample using a double-blind procedure designed to ensure confidentiality of individual student data. The EDI database covered the years 2005–2008; the EQAO database covered 2008–2011. The matched sample comprised a total of 73 234 students or 58% of the average EQAO provincial reporting population for the years 2009–2011. A total of 2485 schools (or 74% of all English-language schools) and 41 school boards (or 68% of all English-language school boards) were represented.

⁵ Students were identified as having special education needs if they had been formally identified at their school by an Identification, Placement and Review Committee or had an Individual Education Plan. Students whose sole exceptionality was giftedness were not included.

⁶ Shonkoff, J. P. & Phillips D. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington: National Academy Press.

⁷ Musio, J. and McCrea, P. (2011). *Birthdate and student achievement: The effects of school grouping practices in British Columbia*, British Columbia Ministry of Education. Victoria: BC Ministry of Education.

Questions for Educators to Reflect On

- 1 What early-years programs and resources are available in our community to support learning for young children and their parents?

 - 2 How are students in our school regularly assessed in kindergarten? What do the most recent assessments tell us about the support children require in their stage of development? What areas of their development display the greatest need for focused support?
 - Physical development?
 - Social skills?
 - Language development?
 - Emotional maturity?
 - Cognitive development?

 - 3 Based on the results of the school's last two administrations of the EDI, are there particular groups of students who seem to require intervention and support from one cohort to the next?
 - Boys?
 - Girls?
 - Younger students?
 - Students whose first language is other than English?

 - 4 What intervention strategies are currently being used to attend to the needs of students in the primary grades? Are there particular approaches to be considered for boys? For girls? For younger students? For English language learners? What insights does the kindergarten curriculum provide about individualized, developmentally appropriate teaching and learning approaches for young students?

The *Full-Day Early Learning Kindergarten Program for Four- and Five-Year-Olds: A Reference Guide for Educators* can be found at www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten.html.

 - 5 What support and guidance can be given to parents of students who require additional support? Has our school emphasized the value of parent engagement and provided opportunities for parents to become involved in their children's education? Have we communicated clearly to parents the importance of children's regular school attendance, and have we consistently followed up with students who are absent?

 - 6 How can we share the following documents with parents?
 - "Tips and Tools for Parents: 10 Tips to Get Your Child Ready for School"
 - "Parenting and Family Literacy Centres"
 - *Helping Your Child with Reading and Writing: A Guide for Parents*
 - *Helping Your Child Do Mathematics: A Guide for Parents*These resources can be found at www.edu.gov.on.ca.

 - 7 Have you visited and shared the parent and educator resources available from EQAO at www.eqao.com?
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