

The Relative Quality of Secondary Leavers in Ontario: A Review of the Evidence



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Table of contents

Executive summary	11
Summary of findings	12
Implications for policy and additional research	13
Chapter 1: Introduction	15
Organization of the report	17
Conceptual framework and report methodology	18
Economic production functions and school effects frameworks	19
Adult literacy framework	20
Background to the international and national measures of literacy	22
Why level 3 is so important to education	25
Chapter 2: Perceptions of the quality of Ontario's secondary system- a media and trends analysis	27
What the media have been saying	27
Methodology for the media trends analysis	27
Common types of articles	29
Key outlets and influencers	41
What public opinion says about the quality of Ontario secondary schools from the OISE Survey, 1998-2007	42
What the survey is about	43
Improved perceptions of quality	44
Satisfaction Up; Confidence Lags	44
Standards, streaming and outcomes	45
What the academic research literature says about the quality of secondary education	47
Chapter 3: Factors that may influence the perceptions of post-secondary educators of the skills of incoming secondary school cohorts	49
Changes in the skills of secondary leavers over time	50
Changes in admission criteria over time	50
Changes in the efficiency of selection over time	50
Changes in rates of post-secondary participation over time	50
Changes in the demographic characteristics of who participates	50
Changes in the expectations of instructional staff	51
Changes in the expectations of students	51
Changes in the quality of instruction	52
Other changes in the delivery of post-secondary education	52

Table of contents

Changes in the relative importance of different skills over time	52
Changes in the relative returns to post-secondary education over time	52
Implication for the current analysis	53
Chapter 4: The current quality of youth leaving Ontario's secondary system:	
What the available evidence says	55
Has Average Quality Been Falling Or have the Proportions Of Students	
With Low Reading Literacy Scores been Growing?	57
Results of the gradient analysis	58
Summary	60
Chapter 5: Moving beyond outgoing quality: A review of the evidence	61
How does the quality of Ontario's education system compare to	
other provinces over the long term?	61
Comparing cross-sections	65
Trends in secondary completion	67
Trends in participation at the post-secondary level	69
Recent relative trends in post-secondary participation	75
Actual post-secondary participation rates for a recent cohort of students	77
Literacy and post-secondary studies	79
Chapter 6: To what extent does access to Ontario's post-secondary system	
depend on literacy skill?	81
Comparing the literacy selectivity of jurisdictions' post-secondary systems	83
Chapter 7: Changes in the delivery of post-secondary education	87
Chapter 8: Trends in the labour market outcomes of Ontario post-secondary graduates	91
Chapter 9: The future	99
Chapter 10: Summary and conclusion	105
Appendices	109
Appendix A: What are socio-cultural gradients and what do they show?	109
Appendix B: References	113
Appendix C: Statistical tables	117
Appendix D: Acknowledgements	137
List of Figures	
Figure 1.1 Functional Magnetic Resonance Images (MRI) of the Brain at Work	25
Figure 1.2 The Mosenthal Taxonomy	26
Figure 2.1 Percentage seeing improvement in the quality of education	
over the past 10 years	44
Figure 2.2 Streaming and testing at high school	45

Table of contents

Figure 4.1	Average reading literacy scores of in-school youth aged 15 in 2000, provinces and countries, 2000	57
Figure 4.4	Gradients in average literacy scores by socio-economic status, Ontario students aged 15 in 2000 and 2006	58
Figure 5.1	Average literacy scores of the population aged between 17 and 25 (log deviations from the national mean at each period), 1951-2001, Canada and the provinces	63
Figure 5.2	Average literacy scores across selected regions and provinces, population aged 16 and over 1994 and 2003	64
Figure 5.3	Changes in the distribution of literacy levels across selected regions and provinces, population aged 16 and over, 1994 and 2003	65
Figure 5.4	Average document literacy scores by age, 1994 and 2003, Canada	66
Figure 5.5	Average document literacy scores by age, 1994 and 2003, Ontario	67
Figure 5.6	Reductions in high school drop out rates by province, 2000	68
Figure 5.7	Absolute rates of post-secondary participation at the college level by province, 1992-2007	69
Figure 5.8	Relative rates of post-secondary participation at the college level by province, 1992-2007	70
Figure 5.9	Absolute rates of post-secondary participation at the university level by province, 1992-2007	71
Figure 5.10	Relative rates of post-secondary participation at the university level by province, 1992-2007	72
Figure 5.11	Rates of post-secondary participation at the university level and college level combined by province, 1992-2007	73
Figure 5.12	Percentile distribution of PISA scores and implied minimum cut-off for post-secondary admission by age 21, Ontario, 2000	74
Figure 5.13	Relative university enrollment rates by province, youth aged 15 to 24 by province, 1992/1993 and 2007/2008	75
Figure 5.14	Relative university enrollment rates by province, youth aged 25 to 34 by province, 1992/1993 and 2007/2008	76
Figure 5.16	Percentile distribution of PISA scores and implied minimum cut-off for post-secondary admission by age 21, Ontario, 2000	79
Figure 6.1	The likelihood of completing high school by age 21 by reading proficiency levels at age 15, Ontario 2006	82
Figure 6.2	The likelihood of post-secondary participation by age 21 by reading proficiency levels at age 15, Ontario, 2006	83
Figure 6.3	The relative likelihood of post-secondary participation by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006	84
Figure 6.4	The relative likelihood of post-secondary participation at the university level by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006	85
Figure 7.1	University student/faculty ratio by province, 2000/2001 and 2005/2006	88
Figure 7.2	Relative university student/faculty ratio by province, 2000/2001 and 2005/2006	88

Table of contents

Figure 8.1	Full-time employment rate by province for those having completed a college program in 1990-2005	92
Figure 8.2	Full-time employment rate by province for those having completed a Bachelor's program in 1990-2005	92
Figure 8.3	Relative average wage rates for college graduates, 1995-2005, by province	93
Figure 8.4	Relative average wage rates for Bachelor's graduates, 1995-2005, by province	94
Figure 8.5	Relative full-time employment rates for college graduates who did not pursue further education, 1995-2005, by province	95
Figure 8.6	Relative full-time employment rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province	95
Figure 8.7	Average wage rates for those having completed a college program who did not pursue further education, by province, 1990-2005	96
Figure 8.8	Relative average wage rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province	96
Figure 8.9	Relative average wage rates for those with earnings, aged 25 to 34, 1995-2005, by province	97
Figure 9.1	Projected numbers of adults aged 16 to 26 by prose literacy proficiency level, Ontario, 2001-2016	99
Figure 9.2	Projected proportions of adults aged 16 to 26 by prose literacy proficiency level, Ontario, 2001-2016	100
Figure 9.3	Projected numbers of adults aged 16 to 26 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016	101
Figure 9.4	Projected proportions of adults aged 16 to 26 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016	101
Figure 9.5	Projected numbers of adults aged 16 to 26 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016	102
Figure 9.6	Projected proportions of adults aged 16 to 26 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016	102
Figure A.1	The PISA and IALSS proficiency scales compared	111
Figure A.2	A comparison of the PISA and IALS distribution by proficiency level	111
List of tables in text		
Table 2.1	Search terms, articles, date of articles and sources	28
Table 2.2	Influencers and sources by number of articles by date range	42
Table 2.3	Overview of Ontario institute for studies in education survey questions, 1998-2007	43
Table 5.15	Proportions of the 2000 cohort of 15 year olds participating in post-secondary education by age 21 by reading proficiency at age 15, for Ontario	78
Table 10.1	Summary of topic area, research questions, methods, analysis and conclusions	107

Table of contents

List of tables

Table 2.1	Percentage seeing improvement in the quality of education over the past 10 years	117
Table 2.2	Streaming and testing at high school	117
Table 4.1	Average reading literacy scores of in-school youth aged 15 in 2000, provinces and countries, 2000	118
Table 4.4	Population sizes, sample sizes and proportions of students scoring below IALS level 3 by immigrant status, Ontario, 2000, 2003, and 2006	119
Table 4.6	Expected scores of an Ontario student who was of average an SES (SES=0 scaled on 2000 value), literacy, mathematics and science, 2000, 2003, and 2006	119
Table 5.2	Average literacy scores across selected regions and provinces, population aged 16 and over 1994 and 2003	120
Table 5.3	Changes in the distribution of literacy levels across selected regions and provinces, population aged 16 and over, 1994 and 2003	121
Table 5.7	College enrollment rates all ages by province; 1992/1993 and 2005/2006	122
Table 5.9	Absolute rates of post-secondary participation at the university level by province, 1992-2007	123
Table 5.10	Relative rates of post-secondary participation at the university level by province, 1992-2007	123
Table 5.11	Rates of post-secondary participation at the university level and college level combined by province, 1992-2007	123
Table 5.13	Relative university enrollment rates by province, youth aged 15 to 24 by province, 1992/1993 and 2007/2008	123
Table 5.14	Relative university enrollment rates by province, youth aged 25 to 34 by province, 1992/1993 and 2007/2008	124
Table 6.1	The likelihood of completing high school by age 21 by reading proficiency levels at age 15, Ontario 2006	125
Table 6.2	The likelihood of post-secondary participation by age 21 by reading proficiency levels at age 15, Ontario, 2006	125
Table 6.3	The relative likelihood of post-secondary participation by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006	125
Table 6.4	The relative likelihood of post-secondary participation at the university level by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006	126
Table 7.1	University student / faculty ratio by province, 2000/2001 and 2005/2006	127
Table 8.1	Full-time employment rate by province for those having completed a college program in 1990-2005	128
Table 8.2	Full-time employment rate by province for those having completed a Bachelor's program in 1990-2005	128
Table 8.3	Relative average wage rates for college graduates, 1995-2005, by province	129

Table of contents

Table 8.4	Relative average wage rates for Bachelor's graduates, 1995-2005, by province	129
Table 8.5	Relative full-time employment rates for college graduates who did not pursue further education, 1995-2005, by province	130
Table 8.6	Relative full-time employment rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province	131
Table 8.7	Average wage rates for those having completed a college program who did not pursue further education, by province, 1990-2005	132
Table 8.8	Relative average wage rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province	133
Table 8.9	Relative average wage rates for those with earnings, aged 25 to 34, 1995-2005, by province	134
Table 9.1	Projected number of adults aged 16 to 26 by prose literacy proficiency level, Ontario, 2001-2010	135
Table 9.2	Projected proportion of adults aged 16 to 26 by prose literacy proficiency level, Ontario, 2001-2016	135
Table 9.3	Projected number of adults aged 16 to 26 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016	135
Table 9.4	Projected proportion of adults aged 16 to 26 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016	136
Table 9.5	Projected number of adults aged 16 to 26 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016	136
Table 9.6	Projected proportion of adults aged 16 to 26 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016	136

Executive summary

This paper addresses research questions set out by the Ministry of Education in its Request for Proposal for a study of the standard and quality of Ontario High School Graduates now and in relation to the past. The research questions, the Ministry's summary of proposed evidence, and brief explanation of the process envisaged by the Ministry appear below:

- What is the public perception of the quality of Ontario high school graduates now and in relation to the past?
- What do we know about the actual quality of Ontario high school graduates now and in relation to the past?
- What perception do colleges, universities, employers have of the standards, quality and “readiness” of Ontario high school graduates for post-secondary pathways now and in relation to the past?
- What successes are Ontario high school graduates experiencing in high school and post-secondary pathways now and in the past?
- How does the standard and the quality of Ontario high school graduates compare nationally and internationally now and in relation to the past?

The Ministry is interested in knowing what an examination of current and historical evidence will reveal concerning the standard and the quality of Ontario high school graduates and,

- international and national level comparisons of secondary school performance, e.g. OECD Programme for International Student Assessment (PISA); Pan-Canadian Education Indicators Program (PCEIP);
- post-secondary education, i.e. “readiness”, participation, marks and success rates;
- the labour market, i.e. “readiness”, workplace satisfaction; and,
- the role of the media, by conducting a media scan.

As agreed with the Ministry, the project team did not investigate in depth every possible element within the topic but rather it undertook a *broad review and focused analysis of the available evidence and information, both past and present, on the actual and perceived standard and quality of Ontario high school graduates* (OMOE, July, 2009, p. 7) [author's italics].

In response to the Ministry request, the consultant, Data Angel, conducted an in depth media content analysis, examined OISE's public attitude surveys over a ten year period, analyzed a range of national and international studies of student and

adult literacy, and created data models to more fully explore findings, some of which point to some areas of concern for now and in the future.

One of the key assumptions that underlies the analysis is that reading literacy – the ability to understand and apply information derived from print – is a reliable proxy for the general skill level of secondary students and, by extension, the relative quality of educational output at the secondary level. Although literacy skill is not a perfect proxy of quality, a large body of research suggests that literacy exerts a profound impact on a range of social and economic outcomes (Statistics Canada and OECD, 2005; CCL and CLLRNet, 2009; DataAngel, 2009). For example, literacy is the single most important predictor of secondary grades, secondary graduation, post-secondary participation, post-secondary persistence to graduation and, ultimately, of relative labor market success. The research methodology for this report incorporates youth and adult literacy measures as a framework for judging quality.

Summary of findings

The major findings from the media analysis are that in the main media covers “hot button” and local issues, for example, double cohort and school board funding, rather than quality of outcomes issues. Over the 25-year period examined, the analysis found scant media coverage on questions of interest to this study such as:

- the quality of graduating Ontario students, even in specialist and trade outlets;
- business and industry’s views on the “readiness” of high school graduates for the world of work;
- the view of Ontario universities and colleges about the readiness of high school graduates to get the most out of higher education.

The public attitude analysis examined reports of five public opinion surveys undertaken by OISE over a 10-year period up to 2007. The survey reports revealed that public attitudes towards high school education have improved more recently, as have satisfaction levels, though confidence in schools lags behind satisfaction and confidence in educational policy remains low.

Findings from the national and international literacy surveys reveal no empirical evidence that supports the central hypothesis that the quality of Ontario secondary output is falling. The authors methodically examined several lines of evidence, which suggest that the quality of secondary output in Ontario is stable and has been rising steadily over time. This conclusion holds true whether judged by absolute or relative rates of change in average achievement both nationally or internationally.

Although Ontario’s secondary student literacy outcomes are not falling, the authors point out that the levels of literacy achievement of recent Ontario high school graduates who go on to post-secondary schooling are still worrisome. Recent national and international research on literacy and essential skills suggests that Level 3 on the IALSS prose literacy scale represents the current minimum needed to take full advantage of education at the post-secondary level, to compete in the global knowledge economy, to be active adult learners and to participate socially and democratically.

The authors found that the literacy levels of a majority of Ontario college attendees are presently less than necessary to take full advantage of their educational experience. To a much more reduced extent, this is true of university students. Sixty (60%) percent of college and 20% of university students have literacy levels below Level 3.

The author's data model indicates that more Ontario students with demonstrably lower literacy levels are entering and exiting the post-secondary systems. In the Ontario post secondary setting these students may or may not achieve an improvement in their literacy — we do not really know. But we do know the literacy levels of Canadians by age categories and that a significant portion of adult Canadians have literacy levels below that necessary to perform effectively, productively and safely in their jobs. These low literacy levels bleed into all areas of daily life, including health outcomes.

Implications for policy and additional research

The analyses presented in this report provide interesting new insights into the functioning of Ontario's secondary and post-secondary education systems. Viewed from a policy perspective, the results raise two key concerns for the authors.

First, the fact that over 40% of students are still leaving Ontario's secondary system with skills below that believed to be needed to support the province's social and economic objectives is both a cause for concern and justification for the Ministry to continue to focus its efforts on improving early literacy outcomes.

Second, the fact that significant proportions of post-secondary participants have literacy skills below that believed to be needed to take full advantage of education at the post-secondary level raises questions about admission standards being applied by the province's post-secondary institutions and raises questions about the impact that these practices are having on the rates of return that students and taxpayers are realizing on their investments.

The results also carry implications when viewed from a research perspective. Given the importance of education to maintaining Ontario's competitiveness in the global knowledge economy we believe that an effort to trace students over time as they move through the primary, secondary and post-secondary systems and eventually out into the labour market is warranted. Such a system, already in place in other jurisdictions, would provide a means to address issues of educational quality and equity in a systematic way.

Chapter 1: Introduction

Few would argue with the fact that massive investment in education has played a central role in affording Ontario residents one of the highest standards of living in the country, and indeed, in the world.

The level of public and private investment in education continues to grow as Ontario seeks to maintain its ability to compete in national and global markets and to move towards the achievement of important social goals.

As a result of these investments, participation and graduation rates have risen over the past forty years at all levels of the Ontario education system, from primary through to the post-graduate level. One of the key drivers of increased participation at the post-secondary level was the creation in the 1970's of the college system in Ontario.

In the secondary system, attention has largely been focused on two objectives – preparing the more academically inclined students for entry into the post-secondary system and preparing the balance of students for entry into the labour market. More recently, attention has increasingly focused on reducing the numbers of students leaving the secondary system without qualifications, on improving early literacy and numeracy outcomes in the primary system and on increasing rates of participation in all levels of the post-secondary system.

Given the simple magnitude of the investments that have been made, Ontarians have an interest in the performance of different parts of the education system. They have a clear self-interest in the return they get on their private investments and a broader interest on the investments they make as taxpayers. Ontario's taxpayers also have a right to expect that these returns will rise over time as the technologies and organizational structures used to deliver educational goods and services evolve.

Education systems are like any other production system – albeit ones that are more complex than most. At any point in time one can identify a production frontier that defines the combination of financial capital, physical capital and human capital that yields the most educational output per unit of investment. Production frontiers are changing over time in response to technological advancement that precipitates increases in productivity. Evidence from comparative assessments of educational outcomes conducted by the International Association for the Evaluation of Educational Quality (IEA) and the Organization for Economic Cooperation and Development (OECD) confirm that large differences in educational productivity exist and that rates of improvement over time vary significantly from country to country. In this setting policy makers, and educational institutions, can ask questions such as:

How far away are we from the current production frontier?

How quickly is the production frontier advancing?

Is our rate of improvement sufficient to close any productivity gaps over time?

This introduction provides a context for the current study. Over the past few months media attention has been focused on the quality of graduates leaving the Ontario secondary system and the negative impact that falling quality is having on the efficiency and effectiveness of the education services offered by Ontario's post-secondary institutions.

The goal of this report is to clarify the nature of the concerns that are being voiced about these issues and to explore the degree to which available empirical data supports claims being made in the print and other media.

More specifically, the analysis presented in this report will attempt to answer the set of questions outlined below:

What is the public perception of the quality of Ontario high school graduates now and in the past?

What do we know about the actual quality of Ontario high school graduates now and in the past? What is the existing evidence?

What perceptions do colleges, universities, employers have of the quality and "readiness" of Ontario high school graduates for post-secondary destinations? Has it changed over the past 40 years?

What successes are Ontario high school graduates experiencing in post-secondary education now and in the past?

How does the quality of Ontario high school graduates compare internationally now and in the past?

The questions set out above fall neatly into one of two groups - one that has to do with the *perceptions* of the relative quality of recent high school graduates and post-secondary entrants and the second that has to do with an objective assessment of the *actual relative quality* of high school leavers (including those leaving without graduating), post-secondary entrants and of those students that persist to graduation.

Answering the questions about the **perceived quality** of Ontario high school graduates - "*What is the public perception of the quality of Ontario high school graduates now and in the past?*", "*What perception do colleges, universities, employers have of the quality and 'readiness' of Ontario high school graduates for post-secondary destinations?*" and "*Has it changed over the past 40 years?*" - can only be answered by summarizing what has been reported in the media. As such the analysis of current perceptions, and how these perceptions have evolved with time, can only provide indicative results.

Answering the questions about the **actual quality** of Ontario high school graduates, of post-secondary entrants and of those students that persist to graduation depends on a thoughtful analysis of the available empirical data. Most of the data that can be brought to bear on this issue were collected for slightly different purposes and, inevitably, there will be gaps between what one would like to know and what one can actually know. As such, the analysis of actual quality can also only provide indicative results.

It is important to note that there is no reason to believe, *a priori*, that either public perceptions or the perceptions of post-secondary institutions should be consonant with objectively assessed reality. In practice, perceptions are often at odds with objective reality. There can be a lag between the availability of reliable information and when it becomes accepted wisdom by different groups. Misinformation, or incomplete information, can distort perceptions. Underlying attitudes, values and beliefs also shape perceptions. Expectations can rise with time in response to changes in the relative importance that system output has on the performance of downstream consumers of secondary output, i.e. the social institutions including post-secondary institutions and employers. And, perhaps most importantly, perceptions are often distorted by the interests of particular groups that stand to win or lose based on how governments see a particular “problem”.

Organization of the report

In keeping with the goals of the analysis the report is organized into nine chapters.

This chapter sets out the report’s objectives and the issues that motivated the Government of Ontario to commission the analysis as well as the methodology and analytical framework used in the report.

Chapter 2 presents the results of an analysis of the media coverage that is related to the issues at hand. The analysis provides readers with a nuanced overview of the issues that seem to be motivating the concern; which groups are manifesting concern; and, the arguments that are being used to justify the criticisms of the current system. The chapter also reviews the results of public opinion polling undertaken by the Ontario Institute for Studies in Education at the University of Toronto.

Chapter 3 provides an overview of the factors that influence the performance of post-secondary education in Canada and by extension the perceptions of post-secondary educators of the skills of secondary school leavers. The performance of post-secondary institutions depends upon a broad range of factors, which are examined in the chapter. These range from changes in the demographic characteristics of who participates to changes in admission criteria over time.

Chapter 4 provides readers with a sense of the complexity that is implied in trying to address the hypothesis of falling secondary quality and its impact on the performance of Ontario’s post-secondary institutions. The chapter presents the results of a series of empirical analyses, including comparisons to international data on reading literacy. These analyses do not support the central hypothesis of the falling quality of secondary graduates in Ontario.

Chapter 5 examines additional comparative data on the quality of recent students from the secondary system in Ontario. The chapter also provides comparative information on trends in key data series related to demographic composition of secondary graduates and other relevant education variables such as graduation rates, post-secondary participation rates, etc.

Chapter 6 examines the question of the extent to which access to Ontario’s post-secondary system is connected to literacy skill levels and considers the impact of student literacy skill on participation and probability of completion at the post-secondary level.

Chapter 7 examines changes in the delivery of post-secondary education that may impinge on the discussion at hand. For example, the chapter analyzes potential impacts of increased post-secondary class size on the perceptions of faculty on incoming students and their quality, the notion being that criticism of secondary quality deflects current realities in the post-secondary sector in Ontario, for example, lack of student support and that students may reasonably infer that higher tuition should mean more rather than less support.

Chapter 8 examines trends in the labour market outcomes of Ontario post-secondary graduates from both colleges and universities. It compares relative average labour market outcomes over time for all Ontario workers over the same time period.

Chapter 9 presents projections of literacy levels over the coming decade.

Chapter 10 summarizes key findings in the report and renders the authors' expert opinion on the central hypothesis. The chapter also makes recommendations about additional research that might shed additional light on the issues addressed in the report.

The report is supported by four annexes:

- **Annex A** provides technical background related to the socio-economic status gradients analysis presented in Chapter 4 and how proficiency on the PISA and IALS scales compares
- **Annex B** provides full references for all sources cited in the report.
- **Annex C** presents the statistical tables that underlie the charts that appear in the body of the report.
- **Annex D** offers a representative sample of the media coverage that the issue has garnered over the past year.
- **Annex E** acknowledges the researchers that have contributed to the production of the report.

Conceptual framework and report methodology

The following discussion pertains in particular to chapters 3-9. Chapter 2, the media and trends analysis, contains its own brief explanation of methodology.

The quality of Ontario's secondary education system is best judged in relative terms. Education is just another technology, albeit a very complex one. Over time technological advances are bound to precipitate increases in the productivity of the educational process and, by extension, the improvement in key indicators of progress such as improvement in standardized test scores. Comparing the quality of Ontario's secondary education system to that of other provinces over the long term is, however, difficult because there are very few data sources that might be brought to bear on the matter.

In this report, we draw on reading literacy as a reasonable proxy for overall student quality. Previous research has shown that literacy has a marked impact on the probability of secondary graduation, the probability of post-secondary participation and the probability of post-secondary persistence to completion (Statistics Canada and OECD, 1995; OECD and HRSDC, 1997; Statistics Canada and OECD, 2000; Knighton and Bussiere, 2003; CMEC, 2010).

With this in mind, the research methodology for this high school leavers¹ project builds on the conceptual underpinnings of economic production functions, school effects and adult literacy research, including the frameworks and data from the International Adult Literacy and Skills Survey (IALSS) and Programme for International Student Assessment (PISA). The analysis undertaken pays particular attention to how efficient the secondary and post-secondary systems are with respect to literacy skill.

Economic production functions and school effects frameworks

The economic literature includes a body of work that focuses on economic production functions: mathematical descriptions of physical systems that transform inputs into outputs through the application of production processes. The report applies these methods to describe the Ontario education system and to provide a context within which to judge the results. The notion of “economic production functions” applied to education systems was pioneered by the likes of Jim Coleman and Hank Levin (Levin, 1980). This framework underpins the study of “school effects” (Raudenbush and Willms, 1995) that attempt to isolate those factors that have the most marked impact on the productivity of education systems.

The theory that underlies the framework posits that educational achievement is, to a large extent, a product of children’s experiences at home and at school, and that the “school effect” is determined by structural features of the educational system, school policies, school resources, and classroom practice. The aim of this approach, known as a production function analysis, is to separate the variation associated with students’ family background and incoming skill from the variation attributable to the quality of schooling. The analysis conventionally uses a powerful statistical technique, entitled Hierarchical Linear Models, to identify the most relevant factors affecting student learning (Raudenbush and Bryk, 1986).

There are many potential determinants of schooling outcomes at each level of an education system. Many of these factors are difficult to measure, and most models of how primary, secondary and post-secondary institutions work are complex, as they try to specify how many potential factors interact with each other within and across levels of the education system.

Levels in educational systems can be defined in a number of ways depending upon how the system is structured. Levels are meant to capture dimensions of the educational system that influence the efficiency or effectiveness of the instructional process, either positively or negatively. The most common and obvious level is grade. At the primary and secondary levels other levels can include the classroom, the school and the school district. At the post-secondary level one needs to account for pre-requisites for entry and the fact that there are several institutional types among which students may choose.

1. The term “High school leavers” signifies all students who have left secondary education, whether as graduates or without a diploma.

Carroll (1963) proposed a simple, straightforward model for school learning that underpinned earlier international comparative studies of student achievement in science (Keeves, 1992). The critical elements of Carroll's model include students' aptitude to learn a specific task, students' perseverance in trying to learn a new task, the time provided for learning a task, the quality of instruction, and student's ability to understand instruction. The Carroll model has been revisited in recent years as part of the literature on effective schooling and its present relevance confirmed.

The model for learning underlying the analyses in this report builds upon Carroll's model. It views school learning as a complex interplay among five key factors:

Quality of Instruction, which is primarily concerned with how effectively important concepts are taught by teachers;

Appropriate level of instruction, which pertains to the delivery of instruction at a level that is consistent with students' abilities to learn the material;

Time, which refers to students' 'opportunity to learn,' which entails not only the total amount of time devoted to instruction, but also the efficiency with which instructional time is used;

Attitudes to learning, which refers to students' active involvement in learning, which is related to their interest in a subject and the extent to which they value schooling outcomes;

Resources, which includes both material and human resources dedicated to student learning.

In the current context, many of these elements are unobserved in the sense that no one has objectively tracked these elements in a stable way over time for the secondary and post-secondary systems. In the absence of stable and comprehensive measurement ideally that traces the trajectories of individual students over time, the risk of omitted variables bias is very high, a fact that invites misattribution of variance in outcomes and false conclusions.

The Carroll model, however, does provide a framework to think about the changes that might have occurred that would support the fundamental premise of the criticism that has been voiced – that the quality of secondary graduates in Ontario has been falling over time.

The balance of this chapter provides a brief discussion of the literature and recent research on literacy and provides a consideration of its impact on individual and societal outcomes.

Adult literacy framework

Literacy – the ability to understand and apply information gleaned from the printed word – has been shown to exert a profound impact on a range of social and economic outcomes.

Differences in average adult literacy level have been shown to exert a profound influence on key indicators of economic success, explaining as much as 55% of long term differences in the long term growth rate of GDP per capita and productivity growth at the national and international level (Coulombe, Tremblay and Marchand, 2004; Coulombe and Tremblay, 2006, Coulombe and Tremblay, 2006). The same

research also suggests that the distribution of adult literacy skill has also influenced the long-term economic success of Canada and its economic peers. Specifically, the higher the proportion of adults with very low literacy skill, the lower overall rates of long term GDP growth.

Research has also established a strong relationship between literacy and a range of outcomes at the individual level. Differences in literacy skill are associated with large differences in employability, wage rates, income and reliance on social transfers, such as social assistance. Adults with higher literacy skills work more, experience less unemployment, earn more, spend less time unemployed and rely less on government transfers (Osberg, 2000; Green and Riddell, 2001; Green and Riddell 2003; Green and Riddell 2007; Raudenbush and Kasim 1998, Statistics Canada and the OECD, 2005).

Literacy has been shown to have an impact on the success of firms. Literacy contributes to effective communication and increases overall productivity (Coulombe, Tremblay and Marchand, 2003; Coulombe and Tremblay, 2005). Literacy skill has been shown to influence the acquisition and application of information and communication technologies in daily life, including the workplace. Adults with high levels of literacy are much more likely to become proficient users of these technologies, and are much more likely to find themselves in high wage stable jobs, a clear sign of literacy's economic value to firms (ETS, 2003). Higher levels of literacy increase employee retention and reduce the incidence and severity of workplace illness and accident (Murray and McCracken, 2008).

It has also been suggested that higher literacy levels would reduce the cost of delivering public goods and services such as health and education, or at least would make existing tax expenditures more productive (CCL, 2007).

Literacy is also intimately related to the efficiency and effectiveness of the learning process itself. Students who acquire sufficient literacy skills are able to become independent learners and hence increase the productivity of the educational process enormously. Differences in literacy skill have also been shown to have a profound influence on various aspects of educational success including the probability of dropping out of high school, the probability of high school completion, post-secondary participation, the level of post-secondary participation, the probability of graduation and the level and intensity of participation in formal adult education and training (Willms, 2003, Knighton and Bussiere, 2006, Rubensson and Desjardins, 2007).

Recent studies have identified Level 3 on the International Adult Literacy Skills Survey as the proficiency level needed by students to support independent learning and by adults to compete fully and fairly in the emerging global knowledge economy and information society (Statistics Canada and OECD, 1995). Large scale longitudinal research in the UK (The Tavistock Institute, 2009) and in the U.S. (Reder, 2009) confirm the link between Level 3 and educational, labour market success and social success.

For example, Level 3 skills are known to be associated with satisfactory job performance in the overwhelming majority of Canadian occupations, with the effective use health information and with full and active participation in the community and the overall society (OECD and HRSDC, 1998; CCL, 2008; Statistics Canada and OECD, 2005).

The impact of lower literacy levels on individual health outcomes includes the probability of experiencing illness, the length of recovery, the cost of treatment and the age at death. Individuals with low literacy skill get ill more often, experience more workplace illnesses and accidents, take longer to recover, experience more mis-medications and die younger (Rudd, Kirsch, Yamamoto, 2004; CCL, 2007).

Literacy has been shown to have a strong impact on the degree of engagement in the broader society. Adults with lower literacy skill levels participate less in community activities, volunteer less and are less likely to vote (Statistics Canada and OECD, 2005; OECD and HRSDC 2000).

This evidence leaves little doubt that literacy is socially and economically important. Canada's labour markets, education system, health system and social system recognize and reward individuals with higher skills – so much so that one can think of these markets as engines for creating inequality in some of the things Canadian's value most – wealth, health, learning, self reliance and belonging.

The evidence also suggests that literacy skill will become increasingly important in the future (Murray and McCracken, 2008; Canadian Council for Learning, 2007). The global supply of literacy is rising rapidly in response to massive educational investments. Access to a skilled and literate workforce allows firms in the developing world to compete on both price and quality. This places intense price pressure on Canadian firms and creates significant financial incentives for firms to move production to lower cost countries.

Markets for key inputs – financial capital, technology and high-end human capital – have gone global, effectively increasing the relative importance of the skills of the workforce for both competitiveness and public policy. Confronted with rapidly rising competition, Canadian firms have few options. One of the few ways in which they can remain competitive is by adopting more efficient work organizations and technologies. By definition, these work organizations are more knowledge and information-intensive and, thus, demand workers with much higher levels of essential skills, most notably higher literacy levels.

Background to the international and national measures of literacy

The Programme for International Student Assessment (PISA)

The Organization for Economic Cooperation and Development's (OECD) Programme for International Student Assessment (PISA) assessment of 15 year olds provides a means to compare the quality of the Ontario primary and secondary system to a broad cross-section of their national and international peers. PISA assesses how far students near the end of compulsory education have acquired some of the knowledge and skills that are essential for full participation in society. In all cycles, the domains of reading, mathematical and scientific literacy are covered not merely in terms of mastery of the school curriculum, but in terms of important knowledge and skills needed in adult life (Statistics Canada, HRSDC and CMEC, 2001).

The International Adult Literacy and Skills Survey (IALSS)

The International Adult Literacy and Skills Survey (IALSS) is a large-scale, international comparative assessment designed to identify and measure a range of skills linked to the social and economic characteristics of individuals across Canada (Statistics Canada and OECD, 1995; Statistics Canada and OECD, 2005). IALSS provides information on the skills and attitudes of adults aged 16 and over in a number of different areas, including:

Prose Literacy: the knowledge and skills needed to understand and use information from texts including editorials, news stories, poems, and fiction.

Document Literacy: the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables, and graphics.

Numeracy: the knowledge and skills required effectively manage the mathematical demands of diverse situations.

A note on the data and modeling used in this in this report is set out below.

This report draws upon data and models that were initially designed to answer related, but different, research questions than posed above. The data presented do, however, offer important insights about secondary education quality.

More specifically the study uses:

- OECD PISA study for Canada to compare the reading skills of Ontario's 15 year old students to those from other provinces in 2000, 2003 and 2006;
- Statistics Canada's 1994 International Adult Literacy Survey (IALS) and the 2003 International Adult Literacy and Skills Survey (IALSS) studies to compare the reading skills of youth aged 16 to 25;
- Statistics Canada's PCEIP program to compare levels and rates of change in participation in post-secondary education by province;
- a longitudinal follow up of the 2000 PISA cohort of students is used to establish actual post-secondary participation rates by literacy skill level;
- a longitudinal follow up of the 2000 PISA cohort of students is used to establish actual post-secondary participation rates;
- Statistics Canada's National Graduate Surveys from 1995, 2000 and 2005 to compare the employment and wage trends of Ontario college and university graduates;
- IALSS to establish the proportions of university and college graduates leaving Ontario institutions between 2000 and 2006 who have skills below IALSS prose literacy level 3.

The analyses employ multiple measures of reading literacy derived from several sources as literacy is the single most important indicator of educational quality. Results of these assessments can be directly compared with a few simple adjustments. The PISA and IALSS data are used to compare the skills of students and youth in several ways.

First, average skill levels are compared over time to determine the rate of change in skills. Falling average scores would provide support for the hypothesized drop in secondary quality.

Second, proportions of individuals at each proficiency level are compared over time to identify changes in the distribution of skill that might not be reflected by changes in average skill. Particular attention is paid to changes in the proportions falling below Level 3 on the IALSS scales. Research suggests that students below this threshold will be unable to take full advantage of education at the post-secondary level and will be far less successful in the labour market as adults. Increases in the proportions of students and secondary school leavers with low skills would provide support for the hypothesized drop in secondary quality.

Third, the relationship between reading literacy scores and the social background of students is compared over time to reveal trends in the social equity of outcomes over time. These analyses were undertaken separately for the children of first generation immigrants, the children of second and older generation immigrants and the children of non-immigrants to see if any group is relatively disadvantaged. Increases in the proportions of low skilled youth in any of these groups might be taken as evidence of declining quality.

The report also uses data from Statistics Canada's PCEIP program to compare levels and rates of change in participation in post-secondary education by province. Levels of post-secondary education high enough to imply the participation of large proportions students with literacy skills below Level 3 would provide support a perception of a drop in secondary quality even if no such drop has occurred. Similarly rapid increases in post-secondary participation rates would reduce perceived quality of Ontario secondary education as they are likely to precipitate a concomitant drop in the average quality of post-secondary participants and in the skills of the least skilled student admitted to study at the post-secondary level.

Data from a longitudinal follow up of the 2000 PISA cohort of students is used to estimate actual post-secondary participation rates for students by the age of 21 and to explore how secondary graduation and admission to college and/or university are influenced by reading literacy scores at age 15. Finding either high numbers of, or elevated probabilities of, post-secondary students with low literacy skills studying at the college or university level might underlie a perception of falling secondary quality even if no such decline exists.

The report also uses data from Statistics Canada's National Graduate Surveys from 1995, 2000 and 2005 to compare the employment and wage trends of Ontario college and university graduates 2 years after graduation to those realized by students from other provinces. Declines in the absolute or relative employment rates of Ontario graduates might be taken as a sign of a decline in the quality of students entering the post-secondary system.

Finally the report presents estimates of the proportions of university and college graduates leaving Ontario institutions between 2000 and 2006 who have skills below IALSS prose literacy level 3. The presence of large proportions of such graduates might be taken as a sign of a decline in the quality of students entering the post-secondary system.

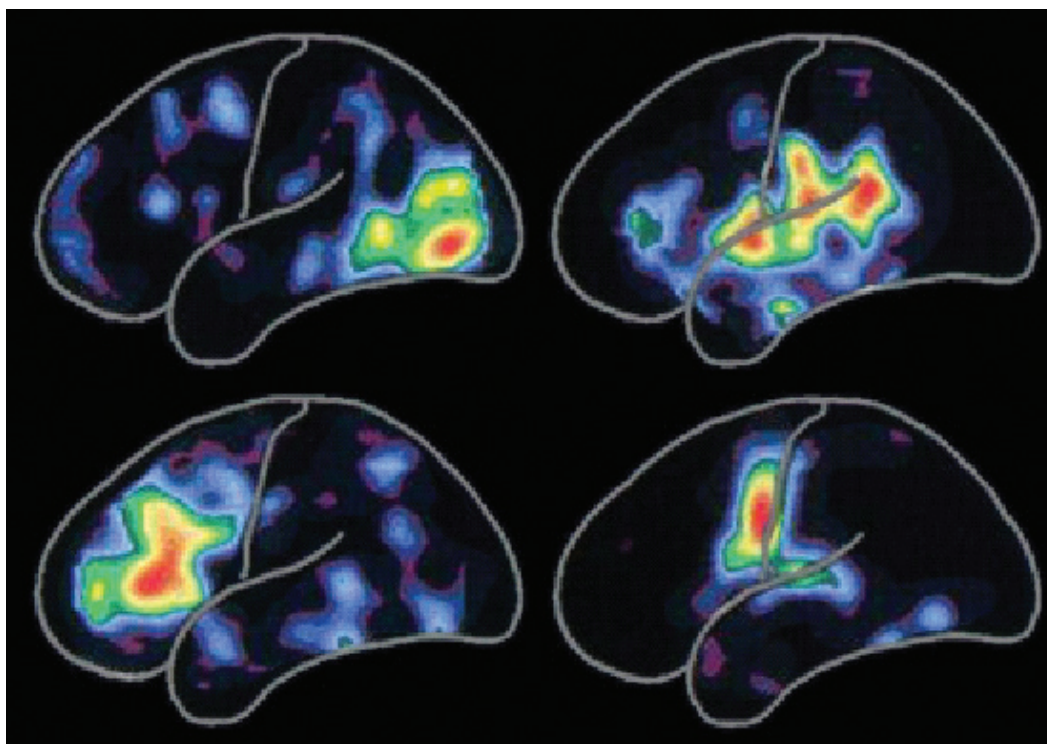
Why level 3 is so important to education

The importance of literacy to the educational process can be traced back to how it supports higher order thinking-based processes that involve the pre-frontal cortex.

The functional magnetic resonance (fMRI) images below illustrate how the transition involves shifts in which parts of the brain are activated. The bottom left shows the brain doing literacy-based thinking.

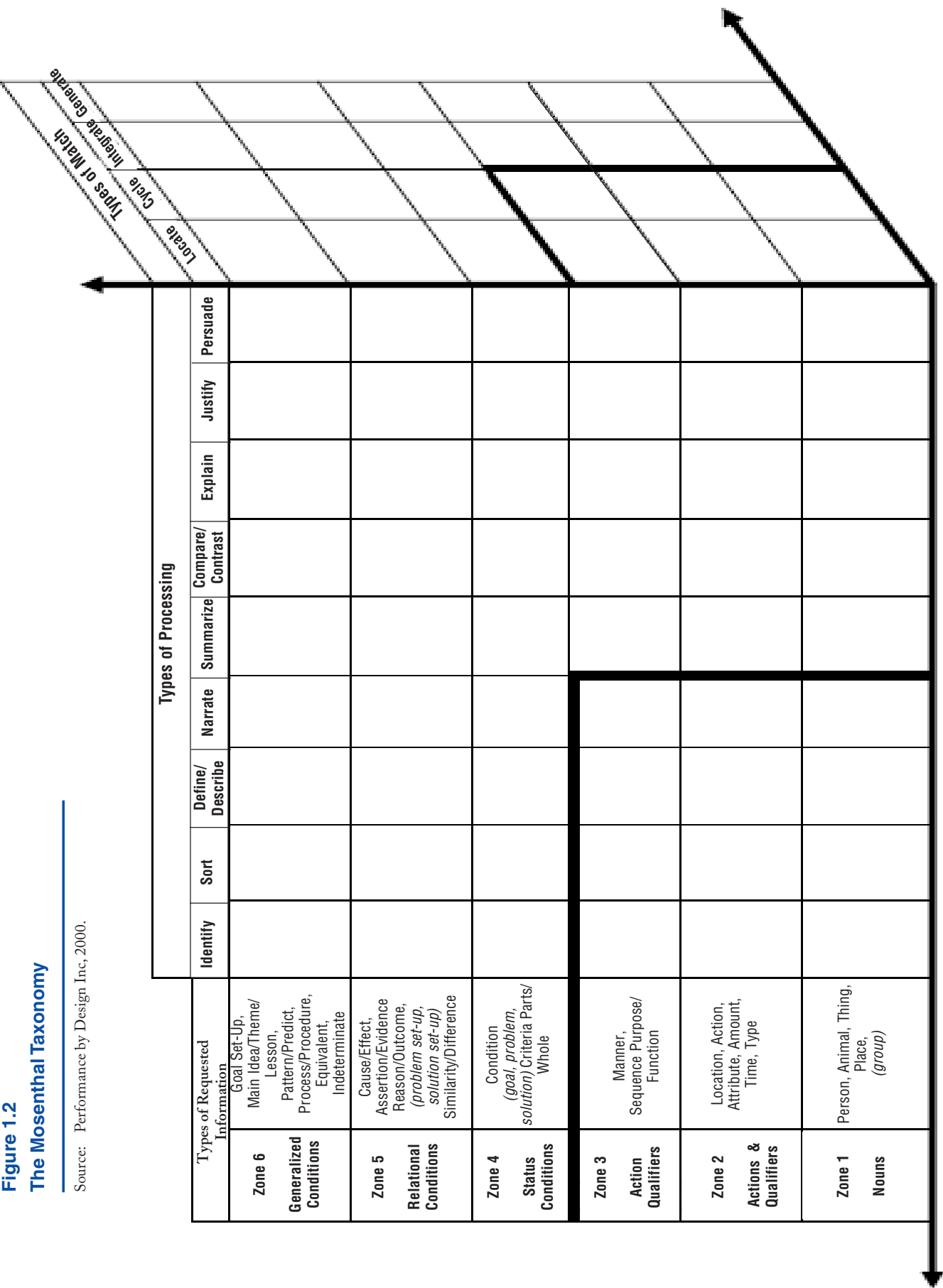
Figure 1.1

Functional Magnetic Resonance Images (MRI) of the Brain at Work



Source: Performance by Design Inc, 2000

The following graphic identifies the factors that underlie the relative difficulty of literacy tasks. The highlighted black box defines the boundary between IALSS prose literacy Levels 2 and 3. Most importantly for the current analysis is the fact that effective post-secondary education presumes that students have literacy skills beyond this boundary, literally that they are able to “think outside the box”.



Chapter 2: Perceptions of the quality of Ontario's secondary system- a media and trends analysis

Two types of analysis were undertaken in order to get a sense of how the media and the general public perceive the quality of Ontario secondary education. The first analysis focuses on a systematic search of media coverage to identify key themes and influencers.

The second analysis explores trends in public opinion as revealed by the Ontario Institute for Studies in Education's series of public opinion polls.

What the media have been saying

Perceptions of quality of Ontario high school graduates by the public and schools of higher education are assumed to be influenced by the volume and type of media coverage given to both local and provincial media coverage. This section of the report reviews and analyzes media coverage going back at least two decades.

Methodology for the media trends analysis

What follows is based on an online search, using a variety of databases and a variety of relevant search terms. A merging of the results of those searches was done. Wherever possible, we have ignored ephemeral or peripheral coverage or articles merely duplicated from chain or other wire services.

Our task was to review articles obtained from online databases, and to do a qualitative analysis of broad themes, key messages and the key influencers of those messages. Using a variety of search terms, we reviewed press coverage of education policy and outcomes in Ontario. As could be expected, the more specific the search term, the fewer articles are captured. There is considerable overlap because one article might fit in more than one category. Because of this, what follows is highly selective and broad-brush, but in it we have tried to provide examples of reporting and comment to illustrate.

We used two databases from ProQuest: CBCA Complete (Canadian Business and Current Affairs), which indexes 540 periodicals and daily news sources (88% of them Canadian) and 1,100 other publications, including consumer and trade magazines, scholarly journals and Canadian Newsstand, which indexes articles from 42 daily and weekly newspapers in Ontario. Both have the virtue of allowing *URL* linking to full text of articles in many instances. Here are the search terms we used and the resultant articles going back about 20 years in some cases:

Table 2.1**Search terms, articles, date of articles and sources**

Search term	Articles	Date range	Source
Ontario and education and quality	1,443		CBCA
Education and Ontario	25,716		CBCA
Ontario and education policy	442	1992-2009	CBCA
Double cohort and Ontario	201	1998-2008	CBCA
Student success and Ontario	122	1999-2009	CBCA
Literacy and high school and Ontario	122	1994-2009	CBCA
Quality of education and higher education	70	N/A	CBCA
Employers and high school and Ontario	59	1993-2009	CBCA
High school graduates and Ontario	43	1996-2008	CBCA
Student achievement and high school and Ontario	30	1998-2009	CBCA
Quality of education and education policy – Ontario	15	1997-2009	CBCA
Secondary students and academic achievement and Ontario	12	2001-2009	CBCA
Graduation rates and high school and Ontario	11	2004-2009	CBCA
Jobs and high school graduates and Ontario	8	1996-2005	CBCA
Community college and applicants and Ontario	7	1995-2006	CBCA
Graduate success and Ontario	5	2002-2004	CBCA
University applicants and Ontario	5	1995-2009	CBCA
Employers and Ontario and high school graduates	4	1996-2006	CBCA
Quality and high school graduates and Ontario	4	2000-2006	CBCA
High school graduates and employment and Ontario	3	2001-2003	CBCA
Student success and higher education and Ontario	1	2003	CBCA
Education and Ontario	15,345	N/A	Newsstand
Ontario and education and quality	811	1985-2010	Newsstand
Double cohort and Ontario	273	1996-2010	Newsstand
Literacy and high school and Ontario	148	1987-2009	Newsstand
High school graduates and Ontario	120	1987-2009	Newsstand
Ontario and education policy	101	1987-2009	Newsstand
Employers and high school and Ontario	75	1986-2009	Newsstand
Student success and Ontario	68	1990-2010	Newsstand
Student success and Ontario and high school	40	2001-2009	Newsstand
Student achievement and high school and Ontario	17	1987-2009	Newsstand
Community college and applicants and Ontario	16	1986-2009	Newsstand
Graduation rates and high school and Ontario	13	1996-2010	Newsstand
Jobs and high school graduates and Ontario	9	1988-2004	Newsstand
Quality of education and higher education	6	1993-2008	Newsstand
University applicants and Ontario	5	1993-2003	Newsstand
Quality and high school graduates and Ontario	3	1988-2001	Newsstand
Employers and Ontario and high school graduates	3	1990-2007	Newsstand
Employers and Ontario and high school graduates	3	1990-2007	Newsstand
High school graduates and employment and Ontario	2	2002-2004	Newsstand
Graduate success and Ontario	0	N/A	Newsstand
Student success and higher education and Ontario	0	N/A	Newsstand
Secondary students and academic achievement and Ontario	0	N/A	Newsstand

After scanning the results of the most focused searches, we looked for common types of articles (news, feature, commentary) and main themes. The analysis also sought to determine who are the main sources and spokespeople in those stories.

And as a result, we have come to some conclusions:

- There is relatively little public coverage of the views of colleges and universities about the quality of graduating Ontario students, even in specialist and trade outlets;
- A good deal of the coverage is repetitive and articles are concentrated on a few issues such as class size, the “double cohort”, access to college or university and perceived shortcomings in literacy, math and science skills;
- Much of the coverage is driven by the largest media outlets such as the *Toronto Star* and its subsidiary *Torstar/Metroland* newspapers in the Golden Horseshoe catchment area. This is almost always because these larger papers and the group invests in dedicated education beat reporting and the stories are repeated through the Canadian Press wire service;
- The *Toronto Star* and, to a lesser extent, the *Globe and Mail* and *National Post*, tend to set the agenda for education reporting;
- Coverage of education tends to be of the “flavour of the month” type. That is, a line of reporting will flare up because of a report, a piece of legislation or a comment in the legislature, be covered in detail in both news and features, then commented upon by editorials, op-eds and letters to the editor;
- The main spokespeople quoted in most of these stories are either political in nature (ministers, superintendents, trustees, heads of unions) or academics or leaders of public interest and advocacy groups (for instance, parents);
- Ministry officials and politicians figure prominently in most substantive stories, except for those of purely local (e.g. school board) interest;
- Most education-related stories are framed more in terms of money (cost) and equality of access rather than the quality of outcomes in providing high school education. The only exception seems to be a great many articles and coverage about the fairness and effectiveness of periodic testing procedures;
- There are relatively few articles providing insight into business and industry’s views on the “readiness” of high school graduates for the world of work;
- There are relatively few articles providing insight into the view of Ontario universities and colleges about the readiness of high school graduates to get the most out of higher education;
- There are somewhat more articles about colleges and universities and their challenges absorbing the numbers of students who wish to attend and the proportion of them that fall short in terms of their skills and motivation;
- Many of the media outlets pick up all or part of release material from the Ontario government and its ministry of education. There are many examples of press releases through Canada News Wire, for instance, tailored to a particular region or locale in the province, highlighting such things as test scores and graduate performance.

Common types of articles

We have identified a number of kinds of articles and issues that are covered. In each instance, we have selected representative or typical stories that illustrate that coverage.

1. Access issues and the “double cohort”

A perennial article, particularly during the run-up to the year of the double cohort in 2002-2003, was reporting on and comment on the bulge of graduating high school students that needed to be accommodated in the higher education system. Here are typical examples including front page news coverage from the *Hamilton Spectator* and the *Waterloo Region Record* (both dailies in southern Ontario that are part of the Torstar network) and:

Entry to university is about to get tougher; [Final Edition]

Chinta Puxley, Education Reporter. The Spectator. Hamilton, Ontario: February 4, 2002. pg. A.01

Experts say demand created by the double cohort — when Ontario abolishes Grade 13 in 2003 and two high school classes graduate at the same time — is going to hit popular post-secondary institutions around Lake Ontario the hardest.

“Institutions in the Greater Toronto Area (GTA) will likely be turning away more students,” said Gregory Marcotte, executive director of the Ontario Universities’ Application Centre.

The province has said every “qualified” and “motivated” student will have a spot in an Ontario post-secondary institution next year.

Education key to quality time for single moms, researchers say; Lack of schooling leads to long hours at low-wage jobs Study

Trish Crawford. Toronto Star. Toronto, Ontario: November 27, 2008. pg. L.1.

A major U.S. study has discovered that the more educated a mother is, the more quality time she spends with her children.

Sociologist Suzanne Bianchi of the University of Maryland is co-author of the study, which found that single mothers - most of whom do not have a post-secondary education - spent less quality time than do those who are married. Quality time was defined as activities beyond core care such as feeding and bathing.

Bianchi said in an interview yesterday that the primary factor was the “never married” mother was likely to work long hours at a low-wage job, because she was less likely to be college-educated or have any economic support from a partner.

At the same time, mothers with college diplomas, whether they were married or single, were able to secure better-paid jobs with working conditions commensurate with raising young children, Bianchi said.

Nuances of university admittance maddening to parents, students.

Sarah Schmidt. CanWest News. Don Mills, Ontario: November 28, 2004. pg. 1.

OTTAWA — At the University of Waterloo, applicants to the engineering program get docked one mark from their overall average for each required course they have repeated - in most cases.

Teens eager to earn admission to McGill University’s science or engineering programs should think twice about trying to inflate their average in Grade 12

with a gym credit. For Mount Allison University applicants, videos or scrapbooks about their contributions to their community and extra-curricular activities will carry equal weight to their high-school grades.

The general formula for admissions at Canada's universities is supposed to be straightforward: if applicants have the minimum required cut-off grade, they get in. But unpublished caveats and special considerations at schools across the country are breeding confusion and frustration.

"The calls start coming in to our liaison office, and they say, 'I know what it says in the handbook, but my son is on the basketball team. Aren't you going to take that into consideration?' Where some of the confusion comes into play is every university handles it very differently," said Pat Harris, an associate registrar at McMaster University in Hamilton.

The distinctions are dizzying.

Ontario's university entrance gap; Research finds C-grade *high school* grads less likely than peers in other provinces to attend elite school

Louise Brown. Toronto Star. Toronto, Ontario: July 25, 2008. pg. A.19.

"Does this mean universities in British Columbia and the Atlantic region are letting in terrible students? I don't think that's true," said Drewes, whose 20-page report is among the first batch of research completed for the new body, which was created by Queen's Park two years ago to help inform government policy on post-secondary *education*.

"But it could also be a matter of choice - that *Ontario* students with an average (grade) in the 60s choose to go to a community college," said Drewes, noting that the province's college system is sprinkled across dozens of communities across the province, reflecting its mandate to offer local access to higher learning.

Of *high school* graduates with averages between 60 and 69 per cent, nearly 43 per cent in *Ontario* attend community college, about 28 per cent in the Maritimes, about 26 per cent in British Columbia, about 20 per cent in the Prairies and 53 per cent in Quebec, where the province's hybrid "CEGEP" college system is more of a step between college and university.

2. Graduate readiness, student achievement and success

Much of the coverage of the quality of graduates and the educational experience focuses on grades and testing. But there is significant coverage and commentary that suggests unease about the quality of the education that Ontario high school students get. On balance, most of the coverage is very positive and emphasizes the gradual improvement in test scores and the number of students that go on to higher education. Less well covered are the trades and apprenticeships – going into the world of work directly from high school.

Better grades? Thank a librarian; Libraries tied to *student achievement* Study makes case for training, funding; [Ontario Edition]

Tess Kalinowski. Toronto Star. Toronto, Ontario: April 7, 2006. pg. A.17.

[Don Klinger]'s study of 800 elementary schools and about 50,000 students showed that schools without trained teacher-librarians were more likely to score lower on grades 3 and 6 reading tests. Schools with teacher-librarians had proportionally more students who scored the highest levels on Grade 6 tests.

“If all school libraries were adequately staffed and sufficiently funded, just imagine the impact on *student achievement*,” said [Michael Rosettis], a teacher-librarian at St. Augustine Catholic *High School* in Markham.

The \$40,000 study was funded by the *Ontario School Library Association*, but conducted independently, Rosettis said. U.S. studies have shown a link between *student achievement* and well- staffed, well-stocked school libraries. The librarians and People for Education say the *Ontario* government has made small steps to stem a 20-year decline in school libraries with a \$17 million book grant last year and another \$15 million last month. Rosettis said he hopes new education minister Sandra Pupatello will find the study compelling enough to consider designating dedicated funds to teacher- librarians and books.

Four of 10 *high school graduates* delay university.

Sarah Schmidt. CanWest News. Don Mills, Ontario: July 4, 2003. pg. 1.

OTTAWA - Four of 10 high school graduates delay post-secondary studies by at least one year and the young men in this cohort are the least likely to eventually enrol in college or university, Statistics Canada reported Friday.

Gender, family background, finances and academic achievement are determining factors related to delayed post-secondary education participation (delayers) or non-participation altogether (no-goers). But not all no-goers are weak students: One in five reported having a grade average over 80 per cent in their final year of high school.

The study, entitled *Who goes to post-secondary education and when: Pathways chosen by 20-year-olds*, also found that high school graduates who did not receive scholarships or grants were also more likely to delay their studies.

Grading higher education; [Ontario Edition]

Toronto Star. Toronto, Ontario: July 27, 2007. pg. AA.6.

“Build it and they will come” pretty much describes Ontario’s current post-secondary education system. As the Higher Education Quality Council of Ontario points out in its first annual report, enrolments in universities, colleges and apprenticeship programs have grown steadily. Over the previous five years, university enrolment increased 34.6 per cent, at colleges the number of students rose by 9.2 per cent, while new registrations in apprenticeships soared by 60 per cent.

The council also says Ontario compares favourably with most large industrialized nations when it comes to the percentage of people who have completed their post-secondary educations.

Yet none of these facts answers some hard questions

Is post-secondary education truly accessible to all qualified Ontarians? If so, why are certain groups, including aboriginals, the disabled, people from low-income families and those whose parents did not get a post-secondary education under-represented at our universities?

Student FAILURE

Ben Levin. Education Forum. Toronto: Winter 2008. Vol. 34, Iss. 1; pg. 33, 3 pgs.

There is a real dilemma here in regard to public perceptions. On one hand, people rightly expect our schools to have high success rates. On the other, if grades or graduation rates go up too much, we hear that this must mean lower standards, that graduating is getting easier. One of my mentors, a director of education in Manitoba who has returned to teaching, used to tell the story of a conversation with his department head who was concerned that nobody had failed my friend's Grade 11 physics course. "Oh," he replied, "I'll try not to teach them so well next time."

Head of UW slams *math* plan; Keep calculus in *Ontario* schools, Johnston urges; [Final Edition]

LUISA D'AMATO. The Record. Kitchener, Ontario: December 23, 2005. pg. A.1.

Ontario's high school graduates are already slipping in their *math* abilities — and the government's decision to drop calculus from the *high school* curriculum puts these students in even more peril, says the president of the University of Waterloo.

David Johnston has written Education Minister Gerard Kennedy, warning of the university's "great concern" if calculus is dropped from *math* courses next year, as is planned.

Before eliminating the fifth year of *high school* in 2003, "*Ontario* could rightfully boast that its mathematics curriculum was second to none in Canada," says his letter, sent this week to Kennedy and *Ontario* Premier Dalton McGuinty.

It will be several years before *Ontario's* already dismal *high school* graduation rate begins to show significant improvement, a new report prepared for the province's Ministry of Education warned Friday

Livingston, Gillian. Canadian Press NewsWire. Toronto: October 14, 2005.

TORONTO (CP) — It will be several years before *Ontario's* already dismal high school graduation rate begins to show significant improvement, a new report prepared for the province's Ministry of Education warned Friday.

The Queen's University study of *Ontario's* new four-year curriculum, which was put in place in 1999, found only 57 per cent of students graduated in 2002-2003, compared with 83 per cent in New Brunswick, 82 per cent in Nova Scotia and 72 per cent in British Columbia, which also have four-year programs.

"However, even under the best of circumstances, four-year graduation rates for the next few years will be substantially lower than those in the three provinces," wrote Queen's professor Alan King, one of the study's key authors.

The King report confirms that 48,000 *Ontario* students weren't able to acquire enough credits to graduate, posing what Premier Dalton McGuinty called Friday a "huge" challenge for the province. "Slowly but surely we're turning things around," McGuinty told a news conference at a northwest *Toronto* high school where the report was released.

“Obviously we still have a lot of work to do to ensure that more of our young people are graduating.”

3. Literacy and numeracy

This was an area in which stories in the database largely originated with the education ministry. There are a large number of press releases through Canada News Wire and they are picked up more or less intact, or as a jumping off point for local or regional coverage. These stories are tied directly to information that is provided publicly about test scores province-wide and at individual school boards.

Literacy skills for many students show improvement in *high school*

Anonymous. The Brampton Guardian. Brampton, Ontario: Jun 4, 2009. pg. 1.

Results of this year's Ontario Grade 10 literacy test show two-thirds of students who could not meet provincial reading and writing expectations in Grade 6 are now achieving standards in high school.

This week, the Education Quality and Accountability Office (EQAO) released highlights of student achievement on the 2009 Ontario Secondary School Literacy Test (OSSLT). High school students are required to write and pass the annual OSSLT to graduate. Students take it for the first time in Grade 10.

This year EQAO was able to track the results of students who wrote the junior division assessment in Grade 6 in 2005 and compare their results to the OSSLT they wrote this past April.

Let's do more to teach *literacy*

Anonymous. Waterloo Region Record. Kitchener, Ontario: Jul 29, 2009. pg. A.10.

It's or its? If you graduate from *high school* in *Ontario*, you should know when the apostrophe belongs in this word and when it doesn't, when you're writing a contraction for "it is" and when you're using a possessive. Unfortunately, more and more students are stumped by this and other simple problems of English language usage.

We recommend that John Milloy, *Ontario's* Minister of Training, Colleges and Universities, immediately set up a task force that brings together school boards and university and college administrators to ensure that the transition to post-secondary education is as smooth and predictable as possible. *Ontario* has been at a disadvantage because it lacks a standardized testing system as students leave *high school*, such as the SAT reasoning tests in the United States. Because of this every *Ontario* student is only as good as the standards of the *high school* teacher grading him or her. There is no province wide standard to guard against grade inflation. This leaves *Ontario* with a pressing need for some kind of formal dialogue between the *high schools* and the post-secondary education institutions.

Halton public *high school* students fare well in *literacy* test

Tim Whitnell. The Post. Burlington, Ontario: Jul 5, 2008. pg. 1.

Fourteen out of Halton's 16 conventional public *high schools* exceeded the average of 84 per cent of students across *Ontario* who passed the test. Ninety per cent of Halton District School Board (HDSB) students who wrote the test for the first time were successful in demonstrating their reading comprehension and writing skills.

Ruth Peden, acting associate director of the [Halton] public board, noted that a pass in the *literacy* test is not an individual score of at least 50 per cent but a student who meets the provincial standard of Level III of academic achievement, which is roughly a 'B' average.

"The Grade 10 *Literacy* Test results are an indication of the efforts of educators to improve students' *literacy* skills across the board," she said. "We're proud of our students' accomplishments and the support our teachers have provided to help all students improve their *literacy* skills."

Students maintain status quo in literacy

Anonymous. The Midland - Penetanguishene Mirror. Midland, Ontario: June 12, 2009. p. 1.

(Staff) - The Simcoe County District School Board has received its latest scores from the Education Quality and Accountability Office (EQAO) tests.

Grade 10 students at 17 schools took the Ontario Secondary School Literacy Test (OSSLT) in April, and their scores were similar to last year. The test of reading and writing skills showed 80 per cent of students who wrote the test for the first time passed.

The results, which can be compared with other schools in the province, show if local students are learning what's expected for their grade level.

"We have seen significant gains in our Grade 6 writing results and believe that this sort of improvement is positioning our students to be successful by the time they reach Grade 10," said Dr. Lindy Zaretsky, superintendent of instructional services and leadership.

4. Education practices

There is surprisingly little coverage of pedagogy and best practices (that is, what works and what is worth emulating) in most of the broader press. Perhaps the difficulty is that this is "inside baseball" and presented in too arcane a fashion for public consumption. In the samples we read, there is seldom more than reactive comment from ministry officials. Surprisingly, too, parents' groups are not widely quoted as sources in this particular area. The homework discussion is a recurring theme.

Homework takes toll on youngest students

[Final Edition] *The Record*. Kitchener, Ontario: *February 11, 2008*. pg. A.1.

While research shows some benefits to homework in Grades 7 and 8 and *high school*, there's scant evidence it improves *student achievement* in younger years, say professors Linda Cameron and Lee Bartel of the *Ontario* Institute for Studies in Education at the University of Toronto. "For elementary school, especially for the primary grades, I am down on homework entirely," said Cameron, a former kindergarten teacher.

Schools seek discipline balance between hard-line and humane; [FIN Edition]

Louise Brown and Trish Crawford Toronto Star. Toronto Star. Toronto, Ontario: May 20, 1986. pg. A.1.

“I grew up in the 1930s, when it was a privilege to go beyond public school. There was tremendous pressure to perform well, and tremendous discipline as well,” said Sel Cooke, business teacher at Birchmount Collegiate. “But when I started teaching in the 60s, suddenly students thought *education* was their right. They walked in and said, ‘Educate me.’”

Still, today’s discipline has a strictness “we wouldn’t have got away with in the ’70s,” said Rev. Gerald Fitzgerald, principal of Regina Pacis (Roman Catholic) Secondary School. “The students would have walked out.” Students today are not as political, said Fitzgerald, “and as kids’ interests in big issues waned, schools were able to move in with discipline.”

Still, violence and outright aggression are rare, say most students and teachers. Not that today’s students are any academic angels. Aside from swearing in class, skipping school and chronic lateness, students can get downright cocky about their own rights, making discipline in the 1980s tricky business indeed.

5. Relations with school boards and education funding

This topic is largely presented as a struggle between provincial funders and locally accountable school boards, presented in a “who gets what” fashion, comparing one jurisdiction with another or positioned as a matter of taxpayers versus school boards. The preferred storyline is often that cuts are threatening educational quality, but very little about how this is so. It is commonplace for trustees, board chairs and representatives of parents’ groups to have their published comments pivot around funding cuts and whether they can be turned back.

‘No choice’ in takeover; Education Minister Kathleen Wynne says seizing control of Peel’s Catholic board was only option after the province ‘tried to bring the trustees on as partners,’ but were rebuffed; [MET Edition]

Tess Kalinowski. Toronto Star. Toronto, Ontario: February 7, 2007. pg. D.1.

As opposition leaders accused the Liberal government of hypocrisy, [Kathleen Wynne] insisted there is a big difference between the kind of control she has given [Norbert Hartmann] at the Dufferin-Peel Catholic board and the Conservative takeover of the Toronto public board five years ago.

“What’s different is that Norbert Hartmann has gone out of his way to try to engage these (Dufferin-Peel) trustees,” said Wynne. “He has consulted with the community, he has met with the trustees, he’s tried to bring the trustees on as partners.”

Hartmann told the 11 Dufferin-Peel trustees Monday they would no longer be a part of financial decision-making since they had repeatedly and unanimously rejected his invitations to help in balancing the budget.

Budget woes hits boards province-wide; Half of public school systems face shortfall; [Ontario Edition]

Tess Kalinowski. Toronto Star. Toronto, Ontario: April 18, 2002. pg. A.08.

Other boards projecting shortfalls, including those in Peel and Durham, say they've already made the kinds of cuts being threatened in Toronto.

The crisis is widespread, said Annie Kidder, of the group People for *Education*. "It's important that we understand it is boards across the province. It's Catholic boards, it's public boards, it's French boards- it's not a Toronto issue."

Toronto Catholic board Chair Joseph Carnevale said urban boards are stressed because there's not enough money being channeled through Learning Opportunities Grants, which are supposed to compensate boards for help given to high-risk students.

Urban schools shortchanged Report; rural counterparts get more funding, says group, despite city hurdles of poverty, crime and racism

Louise Brown. Toronto Star. Toronto, Ontario: April 4, 2008. pg. A.8.

"Urban and suburban schools are where you can have the biggest and most lasting effect on poverty reduction and engaging youth and revitalizing cities - they can be at the centre of all these things, but funding and policy has not kept up," said Annie Kidder, executive director of the non-profit organization.

"The high dropout rates among certain communities ... show the school system does not do well for many communities, yet the government has no anti-racism policy for schools and not enough funding for inner-city students," said [Jeff Kugler], director of the Centre for Urban Schooling at the *Ontario* Institute for Studies in Education.

"Are the programs that kids need being put in place? That's the question that I ask of the system," said [Kathleen Wynne], citing the recent budget, which earmarked \$10 million for urban *high schools* and funded 32 more family and literacy centres.

Ontario cash for schools hits new high; spending up \$378 for every student more specialist teachers, books; [MET Edition]

Kerry Gillespie and Louise Brown. Toronto Star. Toronto, Ontario: June 1, 2005. pg. A.07.

In a bid to enrich learning, boost test scores and reduce dropouts, *Ontario* will spend a record \$8,778 to educate each of its nearly 2 million school children this year - a jump of \$378 per student.

For the Toronto District School Board, the new funds will mean 75 more specialist teachers in elementary school, 160 more *high school* teachers to work with at-risk students and 175 more elementary teachers to reduce class size, said associate director Gerry Connelly.

NDP MPP Rosario Marchese accused the Liberals of "just tinkering with the funding formula."

New *High School* Policy to Cut Dropout Rate

Canada NewsWire. Ottawa: May 2, 2005. pg. 1.

Include salary increases no greater than the provincial guidelines - 2 per cent for 2004-2005, 2 per cent for 2005-2006, 2.5 per cent for 2006-2007, 3 per cent for 2007-2008. In consultation with school boards, the government has added a further. 7% as of August 31, 2008; and,

The policy includes fair and reasonable salary increases for public English-language *high school* teachers that are within the provincial guidelines announced last spring. The combined support for public English *high schools* from new provincial policies will be \$59 million this year reaching \$317 million in 2007-2008. This does not include previously announced *student success* funds.

The province has also indicated to school boards and teachers' federations that it will provide as much as an additional 0.5% above the salary guidelines in 2006-2007 and 2007-08 if rates of inflation and provincial government revenues in those years are higher than predicted in the 2004 *Ontario* budget.

Private sector must do part; [Final Edition]

Doug Draper, *Reporter's View*. Niagara This Week. Thorold, Ontario: December 2, 2005. pg. SC.00.

"It's completely unacceptable, at the beginning of the 21st century, in a knowledge-based economy, to have a 30 per cent drop out rate," McGuinty told reporters following the release of the statistics earlier this fall. At a gathering of local dignitaries this November at the Niagara-on-the-Lake campus of Niagara College, Chris Bentley, the province's Minister of Training, Colleges and Universities, stressed that students dropping out of *high school* without any skills are treading down a dead-end road to underemployment — a circumstance that is bad for them, and bad for a province and country forced to compete in a global economy. The McGuinty government, said Bentley, has already taken measures to stop young people from dropping out of school at age 16 by making it mandatory for them to remain in a classroom setting until they are 18. The government is also pouring more than six billion new dollars into public education over the next five years — one of the largest investments of new money any government in this province has made in education in recent times.

During this same October, about 7,700 jobs evaporated across *Ontario* and the rest of country in the better-paying manufacturing sector, adding to a total loss of more than 128,000 manufacturing jobs over the past year. So how many good-paying jobs will be left in the province, even if the McGuinty government is successful in getting our publicly funded schools to do all they can to train new workers?

I would add that employers in this province can also blame themselves for what [Dan Patterson], Bentley and others predict could be a severe shortage of skilled workers as baby boomers retire in the few years ahead. "The numbers (needed to fill the gap) are staggering," said *Ontario Chamber of Commerce* President Len Crispino, who also spoke at the gathering.

6. Teaching and curriculum

These stories tend to relate to announced changes to curriculum and the commentary about whether such changes are good for students or will work or will be sufficiently efficient and so on. Often, it is a “he said, she said” type of coverage, with ministry declarations countered by comment from teachers unions or academic experts. There are proportionately more opinion pieces on this topic, apparently because everyone has an opinion about what is taught. Occasionally, articles appear in more specialized journals about teaching and curriculum development, but these are rarely seen making the transition into the pages of daily newspapers.

[*Ontario high school students will be required...*]

John Ibbitson and April Lindgren, Southam Newspapers. CanWest News. Don Mills, Ontario: March 3, 1999. pg. 1.

TORONTO - They will learn about the properties of electricity a year earlier. They will study more complex algebraic equations. They will take civics as a separate course.

Ontario Education Minister Dave Johnson will release the new high school curriculum for grades 9 and 10 today at a suburban high school in Brampton. A ministerial background document describing some of the changes to the curriculum has been obtained by Southam News and the National Post.

The new program, designed to integrate the old five-year curriculum into four years, will arrive in high schools this autumn.

In the elementary curriculum, which is already in place, the Conservatives toughened requirements, increasing the emphasis on language skills, mathematics and science. That emphasis continues in the new high school curriculum.

In science, for example, students had previously studied cell structure and cell division in Grade 9, while genetics arrived in the advanced-level Grade 11 course.

Under the new curriculum, cell division, the gene and DNA are all part of the Grade 9 science course, where the properties of electricity are also studied. (It had been studied in Grade 10.)

In English, grade-by-grade learning expectations are included in the curriculum for the first time, while in math, students will study complex, multi-step problems involving algebra, percentages and ratios.

Canadian history and civics have been divided into two separate, mandatory courses. Civics is a half-course, the other half of which is a mandatory course in career studies.

Some courses have been lost, however. Media, once a separate optional course, has now been integrated into grades 9 and 10 English.

Shop classes, outdoor ed returning; But \$150-million Liberal plan isn't enough to restore programs cut a decade ago, says elementary teachers' federation head; [Final Edition]

The Record. Kitchener, Ontario: *January 10, 2008*. pg. A.3.

The Liberals are poised to bring back outdoor education and home economics classes for older elementary students, Education Minister Kathleen Wynne said yesterday.

The Liberals will spend \$150 million during their mandate to improve education for students in Grade 4 to 8, which will mean hiring more teachers to bring back hands-on classes like outdoor education and shop class, Wynne told The Canadian Press.

The province is also looking at starting co-op programs for Grade 7 and 8 students to give them some hands-on work experience, she added.

"We know that if we're going to be successful in getting more kids through high school and going on to post-secondary or into apprenticeships, we have to have them engaged by the time they get into Grade 9," Wynne said after touring a school in London, Ont. "It's way too late if we wait until Grade 9."

Although some critics say \$150 million won't restore the specialized classes cut in the 1990s, Wynne said many schools have classrooms equipped to offer programs like shop and family studies. Those schools haven't been able to make use of the classrooms because they haven't had the teachers, she said.

"If we can find a way to get some extra staffing into those schools, then a lot of those programs may be able to start up again," Wynne said.

Curriculum audits: achieving alignment for *student success*

Borst, John. *Education Today*. Toronto: *Spring 2003*. Vol. 15, Iss. 1

Imagine being invited to a school district in Canada and being asked to evaluate how well it has been teaching its children. For the past half-dozen years, four Ontario administrators have had exactly that opportunity in school systems in the United States and Bermuda. This is the story of how Dan Mason, Bev Freedman, Trudy Lum and Wanda Matuszkiewicz became involved in the business of auditing on an international scale.

The opportunity for these four senior administrators, all with board portfolios centred on improving programs, to become involved in this field came through a process borrowed from business and developed in the United States called the curriculum management audit or curriculum audit.

The curriculum management audit process was developed along the same principles as a financial audit by Professor Fenwick English, currently at the University of North Carolina at Chapel Hill, while he was working with Peat Marwick. It was first used in Columbus, Ohio, in 1979. Since that time hundreds of school systems have been audited in the United States and in several other countries such as Saudi Arabia, Bangladesh and Bermuda. Many of these have involved Canadian auditors; however, no audit has yet been performed in any Canadian jurisdiction.

As in a financial audit, English arranges for a team of external auditors; they will examine how the written, taught and tested curriculums meet five standards he has identified. What makes this management review really unique is that it is centred on curriculum. Thus when the auditors examine areas such as board policy and operations, the management structure of the system, planning, the quality of curriculum documents, assessment and testing, equity issues, budgeting and school facilities data, they are attempting to determine how well every aspect of that system is aligned with the objective of improving student achievement.

Key outlets and influencers

The following table is in no way exhaustive, but gives a good indication of the ways and means that the public gets information about high schools, education and performance. Most of the stories that appear on radio or television are based on an agenda still set in print.

It is worth noting that the spokespeople for the government, from the premier on down through the minister of education, tend to be widely quoted and, in many cases, to generate articles through their own releases about government studies and statistics.

One organization, in particular, pays very close attention to educational matters in its coverage and that is the Toronto Star and its satellite dailies and weeklies in the Torstar Metroland Group (Hamilton Spectator, Waterloo Region Record, Guelph Mercury).

Table 2.2
Influencers and sources by number of articles by date range

	Articles	Range
Influencers and sources (all mentions)		
Ministry of Education	157	1986-2009
Dalton McGuinty, premier	120	1990-2009
Ontario Institute of Studies in Education	59	1987-2009
Statistics Canada	45	1986-2009
Education Quality and Accountability Office (EQAO)	42	1995-2009
Kathleen Wynne (then education minister)	35	2006-2009
People for Education	23	1998-2007
Ontario Confederation of University Faculty Associations (OCUFA)	15	1986-2009
Higher Education Quality Council of Ontario	11	2005-2009
David Clegg, ETFO president	8	2007-2009
David Johnston, University of Western Ontario	8	1999-2009
Ontario Chamber of Commerce	8	2000-2005
Toronto Board of Trade	6	1996-2004
Organization for Quality Education (OQE)	5	1992-2005
Leading outlets (Ontario)		
Toronto Star	729	1982-2009
Globe and Mail	224	1982-2009
Maclean's	65	1988-2009
National Post	53	1998-2009
Education Forum (OSSTF)	37	1989-2009
CanWest News	10	
Frequent writers on education (Ontario)		
Louise Brown, Toronto Star	502	1986-2010
Tess Kalinowski, Toronto Star	304	2002-2008
Chinta Puxley, Hamilton Spectator	267	2000-2002
Barbara Aggerholm, Waterloo Region Record	160	1991-2009
Luisa D'Amato, Waterloo Region Record	114	1991-2009
Trish Crawford, Toronto Star	56	1985-2009
Kristin Rushowy, Toronto Star	52	1999-2009
David Crane, Toronto Star	45	1986-2005
Elaine Carey, Toronto Star	22	1985-2006
Sarah Schmidt, CanWest News	18	2003-2005
Kerry Gillespie, Toronto Star	7	1998-2007
Ben Levin, Education Forum	5	2005-2008
Joanne Laucius, Ottawa Citizen	4	1997-2009

What public opinion says about the quality of Ontario secondary schools from the OISE Survey, 1998-2007

This section summarizes what is revealed about the quality of Ontario secondary quality by a series of five surveys fielded by the Ontario Institute for Studies in Education (OISE) between 1998 and 2007. This overview is based on published materials provided directly to the consultant by the Ministry of Education (reports and corresponding questionnaires from 1978 to 2007), and on related special tables available online through OISE. The analysis rolls up the findings and trends identified in the published reports from the past ten years (five surveys: 1998, 2000, 2002,

2004 and 2007), concentrating on public attitudes towards high school education when provided in the published reports.

The summary table below presents an overview of the findings.

Table 2.3

Overview of Ontario Institute for Studies in Education Survey Questions, 1998-2007

	1998	2000	2002	2004	2007
Survey questions	Percent				
Quality improving (high schools)	18	n/a	23	28	30 ↑
Satisfaction levels	44	44	43	56	61 ↑
Confidence in schools	47	54	46	35	36
Support for literacy test	n/a	n/a	78	69 ↑	n/a
Support for streaming	37	44	n/a	48 ↓	n/a
Support for school leaving certificate	n/a	n/a	63	54 ↑	n/a
Purchase of tutoring services	n/a	n/a	23	27	24 ↓
Purchase of tutoring by satisfaction	n/a	n/a	n/a	47	63 ↑
Purchase of tutoring by rating of local school ¹	n/a	n/a	n/a	50	38

1. These percentages represent responses to a similar, but not identical, question.

Overall respondents perceive improved quality at the high school level has increased over the past decade. This needs to be seen in the context where confidence in schools lags behind satisfaction and confidence in educational policy remains low.

What the survey is about

The OISE Survey of Educational Issues has received financial support from the Ontario Ministry of Education from its inception in 1978 until 2004; OISE and the Canadian Education Association (CEA) jointly funded the 2007 edition of the survey. Billed as “the only regular, publicly available survey of public attitudes towards education in Canada”, the survey reports have followed a similar format over time. Each issue offers a brief contextual description of the educational and other issues at play in Ontario at the time of the survey. The main body of the report provides a thumbnail sketch of public attitudes on a set of educational issues looking at the current responses and then comparing recent responses to those of past surveys, using basic, descriptive statistics (comparing response percentages survey to survey). In addition, the survey questionnaire generally explores a special topic — with the goal of providing public policy guidance on issues of current import in education.

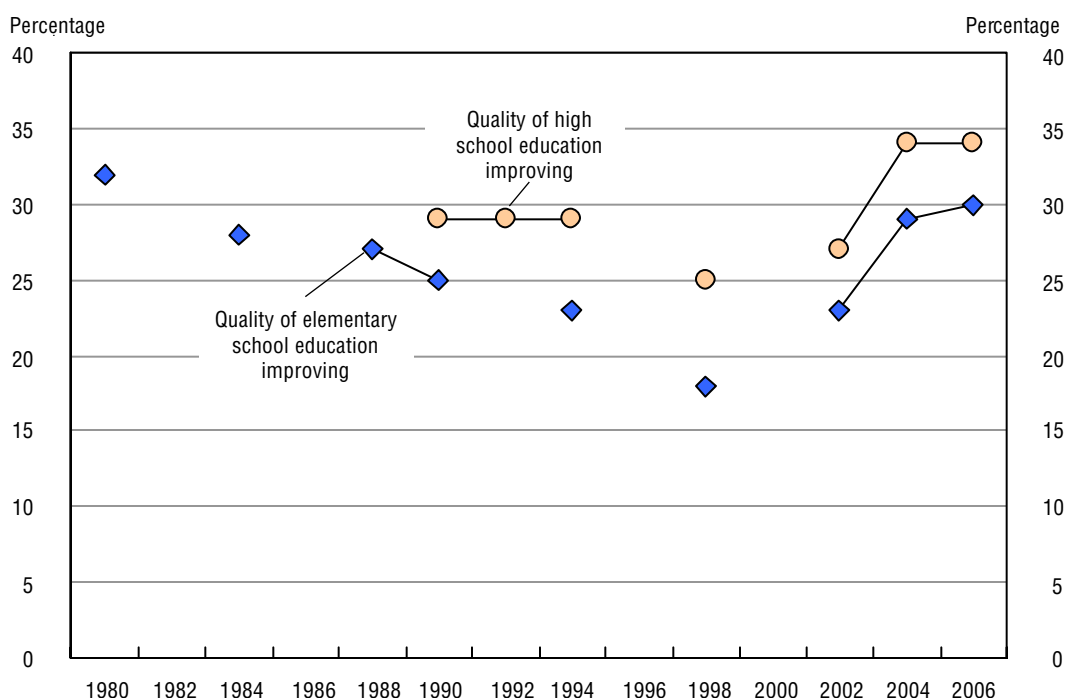
Although the survey questionnaires include specific questions about public attitudes to high school, in the main the survey examines public attitudes towards education in general. If there is a set of current issues pertaining to secondary students and schools, that particular survey report will have more information on public attitudes to high school education than in other years.

Improved perceptions of quality

The OISE Survey of public attitudes to education has tracked whether respondents report “seeing improvement in the quality of education over the past ten years”. The 2007 report indicates that the proportion of respondents perceiving improved quality at the high school level has increased over the past decade.

Figure 2.1

Percentage seeing improvement in the quality of education over the past 10 years



Source: Public attitudes towards education in Ontario 2007, p. 9.

In the 1998 survey, only 18% of respondents thought the quality of high school education had improved as compared to 30% in the 2007 survey (OISE Public Attitudes, 2007, p. 2; 9). The 2007 report also notes that 28% answer no change in quality and almost a quarter of respondents (24%) think things are getting worse.

Satisfaction Up; Confidence Lags

Satisfaction² with the school system in general continues its upward trend from the low levels found between 1998 and 2002. In 2007, just over 60% report that they are very or somewhat satisfied with the school system (OISE Public Attitudes, 2007, p. 2).

2. Note that aside from data on quality of education, the report does not provide the findings for satisfaction and other variables by elementary and high school schools.

Confidence in schools, however, lags behind satisfaction; confidence in educational policy remains low (OISE Public Attitudes, 2007, p.15). One proxy measure of confidence (or the lack thereof) in secondary schools could be seen to be the public support for standardized testing in high school. The public may be looking to province-wide testing as a means to achieve overall accountability of the education system by way of an assessment of students who emerge at the end of it. To quote the report:

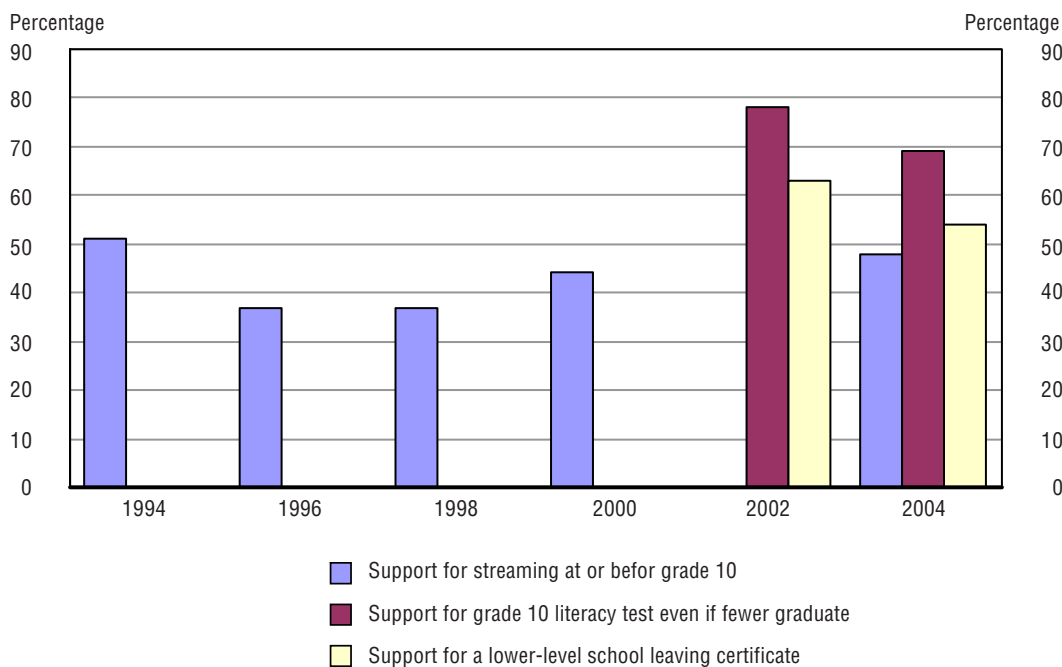
There can be little doubt of public support for province-wide testing. In 2007, 74% favoured province-wide testing to assess the performance of all high school students; 73% would support successful performance on provincial examinations in all compulsory subjects as a requirement for high school graduation. However, 65% thought that high school students' final grades should mainly reflect their teachers' assessments not the results of province-wide tests, up from 50% in 2000 (OISE Public Attitudes, 2007, p. 3).

A growing majority of the public believes that in the main local teachers, rather than provincial exams, should retain the responsibility for the assessment of the final grades of individual students.

Standards, streaming and outcomes

The 2004 Report took a closer look at public attitudes towards “standards, streaming and coping with unequal outcomes” (OISE Public Attitudes, 2004, p. 8). It examined three variables over time: support for streaming at or before grade 10 (1994-2004); support for a grade 10 literacy test even if fewer graduate (2002-2004); and, support for a lower level school leaving certificate (2002-2004).

Figure 2.2
Streaming and testing at high school



Source: Public attitudes towards education in Ontario 2004, p. 8.

The support for streaming is up from a low of 37% in the late 1990s to 48% in 2004; the 2007 survey does not report on this question. At the same time, almost 70% of respondents in 2004 supported grade 10 literacy tests even if that means fewer students graduate, down from 78%³ in 2002 (OISE Public Attitudes 2004, p. 8).

The results of this test have pointed to significant literacy deficits on the part of students in the Applied Stream (OISE Public Attitudes, 2004, p.8; Public Attitudes, 2002, p. 26). Speculation is that these results have affected support for the tests themselves.

Also worth mentioning is that in 2000, while 75% of survey respondents believed that higher standards for students graduating from high school, would not lead to higher dropout rates, in a separate OISE study only 33% of teachers held a similar belief (OISE Public Attitudes, 2002, p. 27).

Both the 2002 and 2004 surveys addressed the issue of support for a lower-level school leaving certificate. Support was as high as 63% in 2002 and had dropped to 54% by 2004.

Earlier surveys (see OISE Survey 2004) have shown that the public is willing to accept lower graduation rates in defense of standards in basic skill areas, although there is also support for instituting lower-level school leaving credentials for those who cannot meet these standards (OISE Public Attitudes, 2007, p. 14).

Given the results on the literacy test for Applied Stream students, it is not clear what any such credential could signify to the public or parents and students in this stream.

Tutoring services

The purchase of tutoring services is another variable that may be interpreted as an indicator of dissatisfaction or lack of confidence in the school system. The Survey began asking respondents about their use of tutoring services in 2002. Just under one quarter of parents in the 2002 survey reported purchasing tutoring (23.2%); over one quarter of respondents reported purchasing tutoring services in 2004 (27.3%) and this level dropped to 24% in the 2007 survey.

In 2004, the survey focused on the relationship between the purchase of tutoring services and the tendency or predisposition to opt for private educational options. The 2004 report presented the combined findings of 2002 and 2004 in a Special Topic – Purchasing Private Tutoring. Parents of children who had used tutoring were somewhat less likely to describe the quality of education at their own children's school as excellent or good (50% as compared to 63%). Approximately half (47.1%) of those who had purchased tutoring services reported being dissatisfied with the school system in general, as compared to one third (30.3%) of the non-purchasers (Special Topics – Purchasing Tutoring Services, Tables B4; B5, Retrieved December 8, 2009, from <http://www.oise.utoronto.ca/OISE-Survey/specialTopics/tutoringPurchaseTable.html> .

3. Please note that the 2002 Report gives a much higher figure of 86% of respondents who support grade 10 literacy tests even if that means fewer students graduate for 2002(OISE Public Attitudes, 2002, p. 26). The difference cannot be accounted for based on the information provided in the reports.

Yet:

Those who hire tutors are no more likely than other parents to support policies that might promote a flight from the public school system (Special Topic, Purchasing Private Tutoring, p. 1 Retrieved December 8, 2009, from <http://www.oise.utoronto.ca/OISESurvey/specialTopics/tutoringPurchase.html>).

The analysis found no statistically significant differences between tutoring purchasers and non-tutoring purchasers with regard to their attitudes about support for direct government funding of private schools or tax credits for parents of private school students.

In 2007, the researchers compared the attitudes of those who purchased tutoring with those parents who did not in light of parents' views of the school system and local schools:

Those who purchased tutoring are somewhat less satisfied with the school system in general than those who did not purchase tutoring (63% [satisfied] versus 75%) (OISE Public Attitudes, 2007, p. 10).

On the positive side, the level of satisfaction of both purchasers and non-purchasers of tutoring appears to be on the rise in 2007 — for purchasers of tutoring up from 47% in 2004 to 63% in 2007; for non-purchasers up from 62% to 75%.

As far as rating of local schools, purchasers of tutoring are less likely to reward their school with an A or B grade (38% compared to 56% of non-purchasers). When rating the quality of high school education:

Parents who purchased tutoring are more likely to think the quality of high school education has stayed the same rather than improved, compared to parents who have not purchased tutoring (OISE Public Attitudes, 2007, p. 10).

The 2004 survey provided a cross tabulation of “rating of quality of school own children attend by whether purchased private tutoring”. Fully 50 % of respondents reported a good or excellent rating and another 28% rated their children’s school as satisfactory. Even though the questions are somewhat different, one could argue that satisfaction levels with local schools of parents who purchase tutoring appear to be on the wane.

At the same time, there are no appreciable differences between purchasers and non-purchasers in terms of attitudes towards worsening of high school quality.

What the academic research literature says about the quality of secondary education

The foregoing analysis of related media coverage identified a number of linked themes. We also performed a cursory review of the academic literature. This review found only one piece of closely related research undertaken by the association of university faculty Association of Universities and Colleges of Canada (AUCC). The study identified a number of concerns about the quality of the incoming cohorts of secondary graduates, including concerns about:

- low maturity levels ;
- poor research skills;
- expectations of success without requisite effort;

- failure to meet deadlines
- poor academic performance
- inadequate study habits

The general overarching theme seems to be that high schools are doing a poor job of preparing students for study at the post-secondary level.

As we shall see there is very little objective data that might allow one to confirm or deny these concerns, particularly over the long term. The objective data that is available relates almost exclusively to whether students have the basic cognitive skills that are needed to support learning at the post-secondary level. These skills include reading literacy, mathematics/numeracy and scientific literacy that provide the basis for critical thinking and research. These data allow one to address the question:

Do Ontario's secondary graduates possess the cognitive tools that are required to take full advantage of education at the post-secondary level?

If the answer to this question is “yes” then one would have to look at why the post-secondary system as currently articulated fails to create the incentives for students to apply these skills.

Chapter 3: Factors that may influence the perceptions of post-secondary educators of the skills of incoming secondary school cohorts

The Carroll model described above provides a framework to think about the criticism that have been voiced – that the quality of secondary graduates in Ontario has been falling over time. On the face of it, the questions set out in the introduction seem to be simple so answering them should also be straightforward. Unfortunately, this is not the case for two reasons.

First, what appear to be a straightforward set of questions on the surface are, in fact, very complex to answer. This complexity stems from a need to decompose the effects of a large number of confounding trends. Analyzing these trends and determining the relative impact that each has on the skills of incoming cohorts of post-secondary participants in Ontario would require the application of sophisticated analytic methods to a broad array of data. Analysis of this complexity is beyond the means of the current analysis in terms of both time frame and the level of funding.

Second, the data that is readily available are not capable of answering the questions unequivocally. One could get closer to a fulsome answer but doing so would require the linkage of primary individual-level micro data from a variety of sources such as the Ontario Universities Application Center, Statistics Canada's Post-secondary Student Information System (PSIS) and Human Resources and Skills Development Canada's (HRSDC) Canada Student Loan database. While possible in theory, gaining approval for such linkages would take a considerable amount of effort and the subsequent investment of significant funds to support the required analyses.

Even if such linkages were approved, large gaps in our knowledge would remain. The performance of post-secondary institutions depends upon a broad range of factors as outlined below. Each of these factors might underlie a perception that secondary quality is constraining the quality of post-secondary output. The truth is that all of these factors likely matter somewhat. The challenge lies in determining which ones matter most and whether they offer any evidence that the quality of secondary quality in Ontario is falling.

The following section provides a partial list of factors that could influence the actual or perceived quality of more recent cohorts of post-secondary entrants so readers have a sense of the scope of factors at play.

Changes in the skills of secondary leavers over time

The most straightforward and obvious explanation that would explain perceptions of falling quality of post-secondary entrants over time would be if the relative quality of secondary leavers is actually falling. Assuming that one can define a minimum threshold skill level below which students cannot take full advantage of education at the post-secondary level then falling skill levels would reduce the proportion of secondary leavers who have the requisite level of skill. In reality, however, it is possible that more recent secondary graduates might be more skilled, less skilled or as skilled as previous cohorts on average.

Changes in admission criteria over time

The criteria and processes used to admit students to post-secondary institutions might be more demanding, less demanding or as demanding as those applied to previous cohorts. Less demanding criteria would mean a higher percentage of less able students being admitted in more recent cohorts of students. If the skill levels of these less able students falls below the minimum threshold for taking full advantage of education at the post-secondary level then post-secondary educators might perceive this as falling secondary quality.

Changes in the efficiency of selection over time

The criteria used to admit students might not have changed but the information used to determine admission might not be reliable. For example this would be the case were marking standards to drop over time leading to grade inflation. As above, grade inflation would lead to higher percentages of less able students being admitted in more recent cohorts. As above, if the skill levels of these less able students falls below the minimum threshold for taking full advantage of education at the post-secondary level then post-secondary educators might perceive this as falling secondary quality.

Changes in rates of post-secondary participation over time

As noted below post-secondary participation rates have been rising rapidly in Ontario. If the quality of new entrants is stable over time, or if participation rates are rising faster than the improvements in skill levels, then the average quality of new entrants is bound to fall. Changes in participation rates among different levels in the system could also have an impact on the average skill level of new entrants.

Changes in the demographic characteristics of who participates

The demographic characteristics of the subpopulation of students changes over time in response to changes in the underlying demographics of the population. For example, rising proportions of immigrants in the general population will naturally precipitate higher proportions of post-secondary age students who are the children of immigrants. These changes can have both positive and negative effects on the average skill of the incoming cohort. Rising numbers of allophone immigrants might reduce the perceived quality of more recent cohorts if their language skills and other

skills are weaker than their non-immigrant peers. It is equally possible, however, that rising numbers of allophone immigrants might increase the quality of more recent student cohorts because they tend to come from higher socio-economic status backgrounds and to have higher levels of motivation and parental support for education.

Shifts in the demographic composition of incoming student cohorts might also be precipitated by changes in the proportions of out of province and out of country students that are admitted. Again, it is not clear what impact these changes might have on the average quality of new entrants to the Ontario post-secondary system.

Shifts in the demographic composition of incoming student cohorts might also be precipitated by changes in the proportion of total costs that are borne by the student. Provided the supply of qualified entrants exceeds institutional capacity, rising tuition fees and living expenses might result in falling average skill levels as richer but less able students displace more able but poorer students.

Finally, changes in the proportion of adult students admitted to the system over time can lead to changes in the average skill level of incoming cohorts and in the proportions of students with skills below the level needed by students to take full advantage of the post-secondary educational experience.

In economic terms the forgoing factors can be classified as shifts in the supply of skilled entrants or in the efficiency of the market mechanisms that allocate access.

The possibility exists that changes in demand factors might also underlie drops in the perceived quality of more recent incoming cohorts.

Demand-side changes include:

Changes in the expectations of instructional staff

Rising participation in post-graduate programs may be causing instructional staff in post-secondary institutions to have higher expectations of more recent incoming cohorts.

Changes in the expectations of students

Increases in the proportion of education costs that are born by the student and in the proportions of students from disadvantaged backgrounds or with higher levels of motivation might translate into higher levels of expectation on the part of more recent cohorts of students. If this were the case these higher levels of expectation might translate into higher levels of stress for instructional staff that might manifest itself as concern about the quality of incoming cohorts. Such transference is a common feature of human nature. Falling returns to post-secondary education and associated increases in competition for good jobs might also heighten student expectations.

Changes in the quality of instruction

The rapid increases in post-secondary participation rates have precipitated a slightly less rapid increase in the size of the post-secondary teaching workforce. There are more part-time and sessional instructors now and larger class sizes on average. It is possible, therefore, that the quality of instruction has deteriorated over time as less-skilled professors have been drawn into the profession and asked to teach more students. If true such a drop in the quality of instruction would likely precipitate a decline in student motivation to learn and perceptions on the part of long-term faculty of declining quality.

Other changes in the delivery of post-secondary education

Changes in the way in which post-secondary education is delivered might themselves precipitate either real or perceived reductions in the quality of post-secondary output that might be misinterpreted as reductions in the quality of student intake. For example, increases in the average class size of undergraduate courses might increase instructor's perceptions of inadequate student quality and reduce the efficiency and effectiveness of instruction. Similarly, the shift toward computer-assisted learning in undergraduate courses might influence instructor perceptions. In the framework outlined above such changes might be having a profound impact on the time allocated to instruction, instructional quality and the resources devoted to instruction. If these changes serve to reduce the overall opportunity to learn then they might serve to reduce levels of student engagement and thus perceived quality.

Changes in the relative importance of different skills over time

Changes in the relative importance of different skill sets to learning over time might influence both perceptions of quality and the actual performance of different sub-groups of students. For example, the increased use of information and communication technologies in post-secondary content and delivery might have shifted importance away from the more traditional skills of structured argument and debate. It is still far too early to evaluate whether this shift will prove to be a good thing or a bad thing over the longer run. This assertion does not, however, preclude teachers in post-secondary institutions from having strong opinions.

Changes in the relative returns to post-secondary education over time

Reductions in the private rates of return to post-secondary education over time might reduce student motivation. There is some evidence to suggest that the returns to post-secondary education may be falling in Canada in response to the rapidly growing supply of post-secondary graduates that is outpacing the demand for such skills. Nevertheless post-secondary credentials remain one of the most important signaling devices to employers at the point of recruitment so anyone without a credential is at very high risk of being selected out of recruitment processes at an early stage. Viewed from this perspective much of the increase in post-secondary participation rates may be defensive, in the sense that it is undertaken solely for the purposes of maintaining relative position in the job market rather than for the

productivity enhancing knowledge and skills that are imparted. If this is true then student motivation may have declined with time.

Implication for the current analysis

It would seem from the foregoing review that there are a myriad of possible processes that theory predicts might underlie a drop in the average quality of Ontario secondary leavers entering the post-secondary system in Ontario. To make matters more complicated, theory and evidence also suggests that many of these processes interact with one another in ways that can either amplify or attenuate effects, often in unexpected ways. Objective measures are simply not available for many of the variables of interest and, where they are, the associated time series are often incomplete. In the worst case a measure may only be available for one time period. The inescapable conclusion is that it is impossible, given current data, to establish unequivocally whether the key hypothesis advanced by the media holds. Thus, the analysis that follows can only attempt to use the available data to explore the issue. By definition the results must be considered to be indicative rather than definitive.

Chapter 4 The current quality of youth leaving Ontario's secondary system: What the available evidence says

This chapter provides a context for the analyses that are presented in this report. Education systems are designed to produce multiple outputs including the knowledge, skills, attitudes and behaviours that will allow youth to take full advantage of the opportunities that adult life presents. To fully address the questions set out above one would need to be able to track each of these aspects over time and to compare the rate of improvement being realized in Ontario to other jurisdictions. In truth very little is known about these outputs for Ontario youth so the current analysis relies on the only reliable time series that is available i.e. the reading literacy levels of Ontario youth. Thus the analysis assumes the reading literacy – the ability to understand and apply information derived from print – is a reliable proxy for the general skill level of secondary students and, by extension, the relative quality of educational output at the secondary level. Although literacy skill is not a perfect proxy of quality, a large body of research suggests that literacy exerts a profound impact on a range of social and economic outcomes (Statistics Canada and OECD, 2005; CCL and CLLRNet, 2009; DataAngel, 2009). For example, literacy is the single most important predictor of secondary grades, secondary graduation, post-secondary participation, post-secondary persistence to graduation and, ultimately, of relative labor market success. The research methodology for this report incorporates youth and adult literacy measures as a framework for judging quality.

The evidence presented leaves little doubt that the skills of recent Ontario secondary students are high by national and international standards and confirm that the quality of Ontario secondary education has not fallen over the past decade. These findings alone call into question the central hypothesis of falling secondary quality.

The chapter addresses the question of the quality of Ontario's current secondary output directly by benchmarking the literacy skill levels of Ontario secondary students against those realized in other jurisdictions.

The OECD PISA study for Canada compares the reading skills of Ontario's 15 year old students to those from other provinces in 2000, 2003 and 2006.

The analysis employs reading literacy data from repeated cycles of the OECD PISA assessment to respond to the following questions: 1) What do we know about the actual quality of Ontario high school graduates now and in the past? 2) What is the existing evidence? 3) How does the quality of Ontario high school graduates compare internationally now and in the past?

Ontario's performance is compared in multiple dimensions as follows:

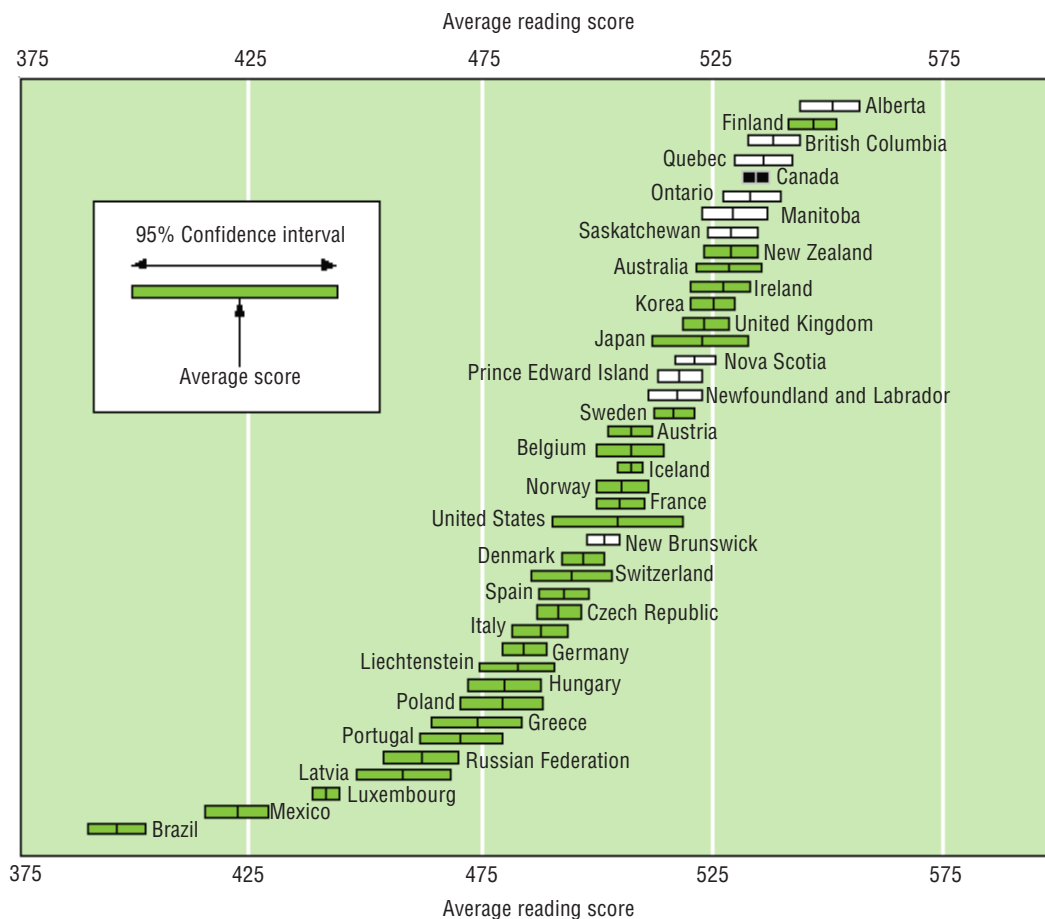
The first analysis compares the average reading literacy scores of Ontario's 15 year olds to those in other provinces and countries. Our assumption is that if Ontario's average scores are high in relative terms then there is little room to support claims of falling quality.

The second, more complex, analysis that follows reveals how the level and distribution of Ontario's reading literacy scores have evolved over the decade for which PISA results are available. The analysis is designed to explicitly test if average quality has been falling or if the proportions of students with low reading literacy scores are growing – both findings that might be taken as evidence of falling quality.

The third analysis measures the degree to which reading literacy scores are related to the social background of Ontario's secondary students. The analysis is designed to detect overall trends in the average level of reading literacy over the 9 year reference period over the full range of socio-economic background. The analysis also documents changes in the distribution of reading skill over time. Finally, the analysis explores variation in the performance across three important sub-populations: for the children of first generation immigrants, for the children of second and subsequent generation immigrants and for children of non-immigrants.

The relative quality of students leaving Ontario's secondary system is judged by averages reading scores in 2000.

The availability of data from the OECD PISA assessment of 15 year olds provides a means to compare the quality of the Ontario primary and secondary system to a broad cross-section of their national and international peers at a specific point in time. The following chart compares scores from the 2000 cycle of PISA assessment that focused on reading literacy.

Figure 4.1**Average reading literacy scores of in-school youth aged 15 in 2000, provinces and countries, 2000**

Source: Statistics Canada, CMEC and HRSDC, 2001.

The chart reveals that Ontario performs well internationally, realizing average reading literacy scores well above many of Canada's key competitors, including the United States and the UK. Nationally, Ontario achieved the 4th highest average provincial score.

Has Average Quality Been Falling Or have the Proportions Of Students With Low Reading Literacy Scores been Growing?

One of the most striking PISA findings is the negative impact that high levels of social inequality have on average performance. Finding high levels of social inequality in the reading literacy performance of Ontario's secondary school students might be taken as a sign of untapped potential at the system level. The comparisons presented differentiate between students who score above and below 529 on the PISA reading literacy scale i.e. above or below IALSS Level 3 on the common PISA/IALSS scale. This external benchmark is meant to give meaning to the PISA scores – research suggests that 529 is the minimum score needed to take full advantage of education at the post-secondary level and to support full participation in various aspects of adult life (Willms, 2007).

The analysis presents an examination of the trends in performance revealed by successive cycles of PISA data for Canada and the provinces. Reading literacy scores are compared across provinces for 3 assessment cycles - 2000, 2003 and 2006. The PISA data reflect the skills of 15 year olds, a point near the end of the secondary cycle of education when the overwhelming majority of youth are still attending school⁴. In PISA great care is also taken to ensure the comparability of the proficiency scales from cycle to cycle so that results may be safely compared over time.

The following charts display the **relationship** between performance on the PISA reading literacy scale and a measure of socio-economic status, which together display a socio-cultural gradient, useful for understanding the performance of an education system (Willms, 2006). The gradients portray the relative level of proficiency and the extent of inequalities among people with differing socio-cultural backgrounds. In this analysis, the indicator of socio-cultural background is comprised only of the respondent's parents' levels of education.

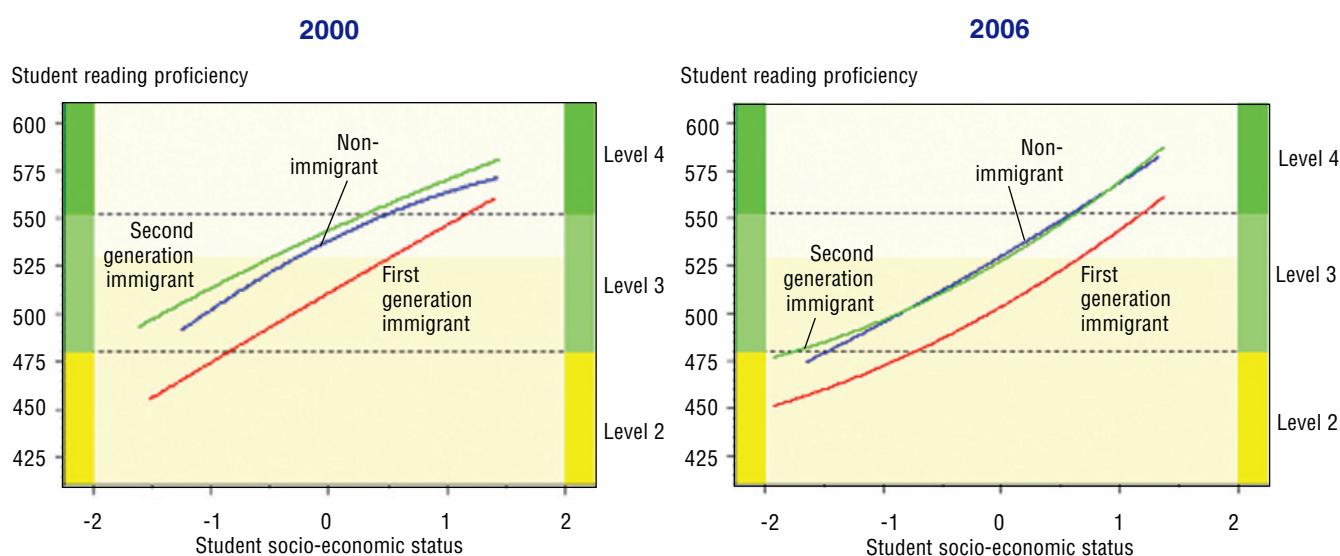
More detailed information about the gradient analysis is set out in appendix A (page 109).

Results of the Gradient Analysis

The following figure presents the results of a gradients analysis of the PISA data undertaken by Doug Willms, KSI Research International using data from the three PISA cycles. Figure 4.4 presents the trend in the average quality of Ontario 15 year olds in PISA reading literacy.

Figure 4.4

Gradients in average literacy scores by socio-economic status, selected groups of Ontario students aged 15 in 2000 and 2006



Source: Special analyses undertaken by Doug Willms, KSI Research International.

4. The estimates are thus relatively free of the statistical bias introduced by differences in cohort coverage that afflict comparisons of students at older ages when significant proportions of low skilled youth have left the education system.

The gradient analysis illustrated in figures 4.4 presents several important findings:

- There is no evidence whatsoever of any decline in the quality of Ontario secondary education over the reference period.
- Large proportions of students leaving the Ontario secondary system have skills below the level believed to be needed to take full advantage of educational opportunities at the post-secondary level. The children of recent immigrants to Ontario exhibit the highest proportions of skill below IALSS Level 3 – 51.8% in the 2006 cohort. Although the proportion of such students does not seem to be growing it would be a source of concern were large proportions of these students to go on to study in Ontario's post-secondary system.
- Children who are from families with relatively lower indices of socio-economic status realize significantly lower average scores. Average scores for all three cohorts display a strong association with social background. Analysis of PISA data reveals that this level of inequality reduces the overall average level of skill and, by extension, the relative efficiency of the education system.
- The length of the gradient lines for all three groups are quite similar, except that children of first generation immigrants in Ontario have a slightly lower average score at the 5th percentile than their peers.
- The children of first generation immigrants living in Ontario exhibit much lower average scores than their non-immigrant and second-generation peers.
- The children of second-generation immigrants outperform non-immigrants, a result that reflects their parent's higher levels of educational attainment.

It is worth noting in passing that the performance of Ontario's secondary leaver's absolute and relative literacy performance must be judged in light of the fact that the province has been absorbing large numbers of children of immigrants whose parents have mother tongues other than the languages of instruction employed in Ontario's primary and secondary schools. Research has shown that the proficiency gap between immigrant and non-immigrant children in Canada is among the lowest of all countries participating countries in the OECD's PISA assessment (Statistics Canada, 2005).

Summary

The analyses in this chapter looked at quality of Ontario's current secondary output using reading literacy as the metric of comparison.

The first analysis compared the average reading literacy scores of Ontario's 15 year olds to those in other provinces and countries. We find that Ontario performs well internationally and nationally.

A second analysis measured the degree to which reading literacy scores are related to the social background of Ontario's secondary students. We find that the children who are from families with relatively low levels of socio-economic status realize significantly lower average scores. Average scores for all three cohorts display a strong association with social background⁵.

Together the data in this chapter provide evidence that the quality of Ontario education is unlikely to have fallen over the past decade. Thus, the roots of the perceived fall in secondary quality must lie elsewhere. The following chapters explore other possible explanations.

5. A third analysis, not reported here, tested if average quality has been falling or if the proportions of students with low reading literacy scores are growing. When changes in the demographic composition of the population are held constant we see virtually no change in the quality of Ontario secondary students.

Chapter 5: **Moving beyond outgoing quality: A review of the evidence**

The previous chapter used literacy data from the PISA study to show that the quality of Ontario's secondary system has been stable over the past decade. Given the importance of this conclusion to the central hypothesis of falling secondary quality it is important to see if other data sources support the conclusion. This chapter presents additional comparative data from the IALSS study on the quality of recent cohorts of students from the secondary system in Ontario. These data buttress the general conclusion that the quality of Ontario's secondary system is high and stable.

The chapter also provides comparative information on trends in key data series, including secondary graduation rates and post-secondary participation rates by level of instruction and. These data are used to explore key questions such as:

How is access to Ontario's post-secondary system influenced by literacy skill? and,

How has rising post-secondary participation influenced the average quality of students being admitted to the post-secondary system?

The evidence presented shows that the pool of post-secondary eligible Ontario secondary graduates has increased steadily over the past 50 years. Moreover the rate of improvement in average scores and in the proportion of students with literacy skills above Level 3 has been more rapid than that observed in other jurisdictions.

How does the quality of Ontario's education system compare to other provinces over the long term?

Comparing the quality of Ontario's secondary education system to that of other provinces over the long term is difficult because there are very few data sources that might be brought to bear on the matter. One source of comparative data that provides some insight on this question is Coulombe's analysis of the long-term trends in youth cohort literacy skill (Coulombe and Tremblay, 2005). The Coulombe analysis compares the skill quality of each province relative to the national mean at 5- year intervals from 1950 to 2000⁶. Research has established that the quantity and quality of initial education are by far the most important determinants of adult literacy levels, explaining fully 60% of observed variance across populations (Desjardins, 2004). It is reasonable to assume, therefore, that the Coulombe data capture most

6. The Coulombe data are normalized to the national mean at each period, a process that removes the overall trend and thus makes it much easier to see changes in the relative position of jurisdictions over time.

of the improvement in educational quality over that the Coulombe data capture most of the improvement in educational quality over time.

The skill measures that Coulombe uses are reconstructed from the cross-sectional age structure observed in prose literacy proficiency found in Statistics Canada's 2003 Adult Literacy and Life Skills Survey (IALSS). These reconstructed skill measures make it possible to compare long-term trends in the quality of secondary educational output at the provincial level. IALSS provides estimates of the average literacy levels and the distribution of literacy by proficiency level for the entire adult population 16 and over.

The Coulombe measures reflect:

- differences in skill quality at secondary graduation for successive cohorts of 16 to 25 year olds,
- the skill gain associated with post-secondary participation, and
- the net effect of literacy skill gain and loss over the remaining life course.

In such a series of measures, skill gain and loss experienced over the life course might be expected to blur the degree to which the estimates provide an accurate reflection of skill differences at the point of leaving the secondary system. In statistical terms skill loss and gain would serve to reduce the correlation between the level of skill observed at leaving the secondary system and skill observed later in life. In reality the magnitude of skill gain and loss are themselves highly dependent on the level of initial skill (Desjardins, 2004).

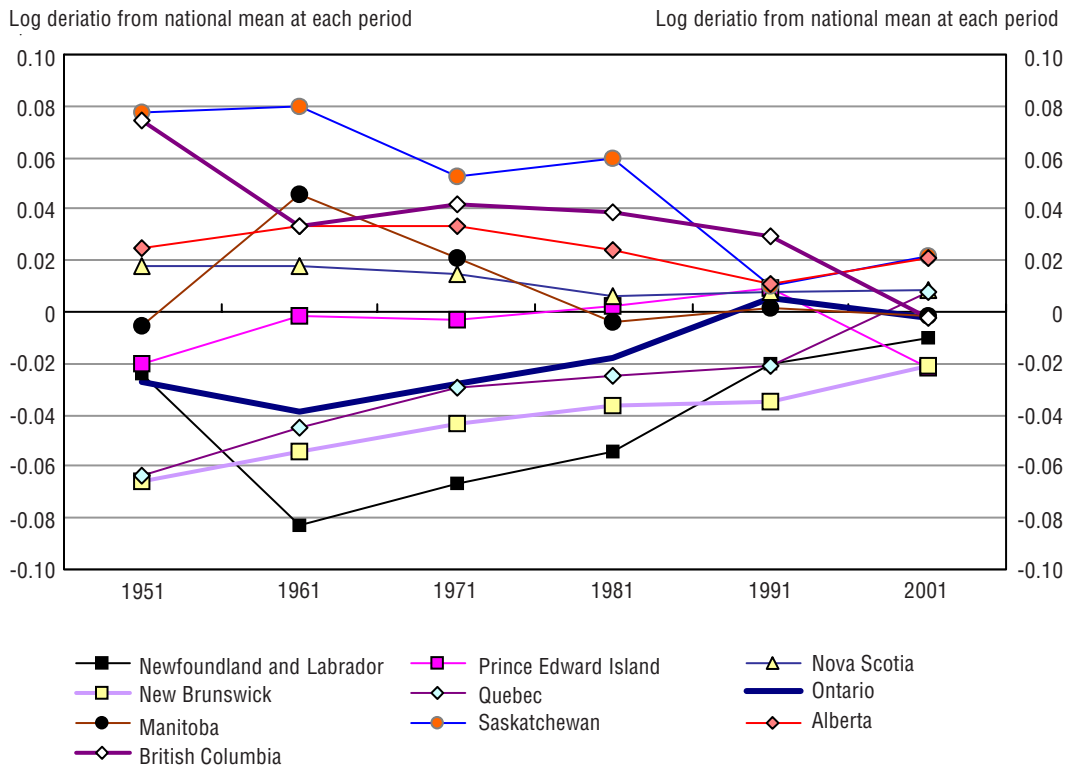
Figure 5.1 reproduces a chart from Coulombe's analysis that compares the skill trajectories of each of the provinces relative to the national mean at each period.

The figure reveals that, among the provinces, Ontario appears to have experienced steady improvement in average literacy scores over the 50 year reference period. More specifically, standardized scores have risen from a low at the beginning of the period of roughly 30% below the national mean to approximately 20% above the national mean at the end of the period. Interestingly, Ontario's provincial rank appears to have risen from 8th to 3rd over this period. At the same time the level of inter-provincial variance in skill appears to be much reduced over time, perhaps as a reflection of reduced levels of inter-provincial variance in education and income levels as well as the transfer of educational "best practice" among jurisdictions (Coulombe and Tremblay, 2005).

These findings provide additional evidence that that the quality of Ontario secondary graduates has not been falling in either absolute or relative terms. These findings buttress the conclusions reached based upon the PISA analyses presented in Chapter 4 and refute the hypothesized decline in secondary quality.

Figure 5.1

Average literacy scores of the population aged between 17 and 25 (log deviations from the national mean at each period), 1951-2001, Canada and the provinces



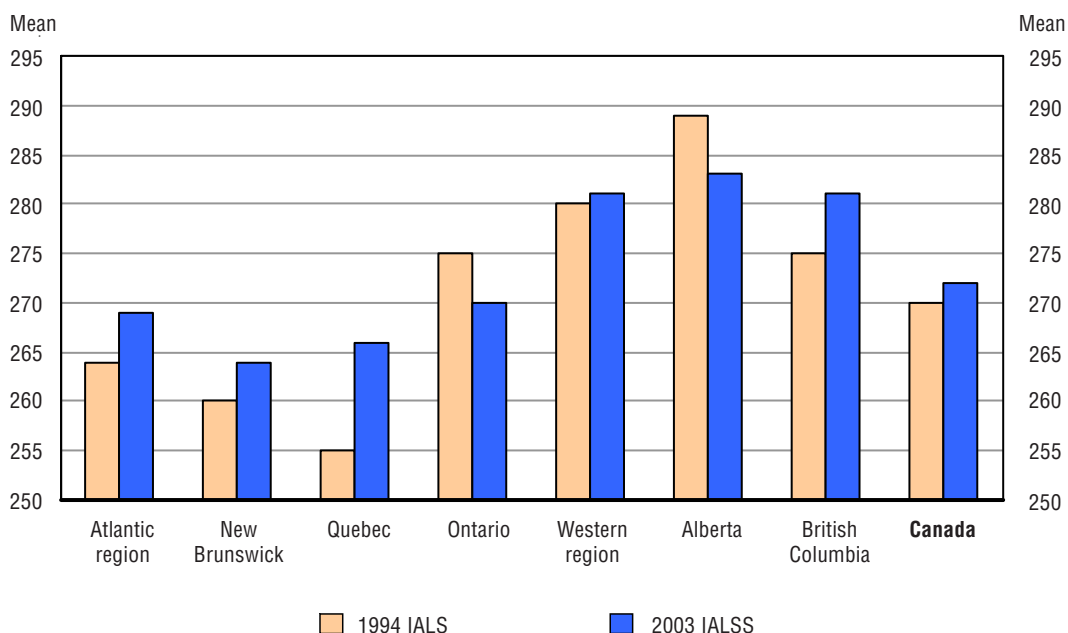
Source: Coulombe and Tremblay, 2004.

How does the quality of Ontario's education system compare to other provinces over the short term?

Figure 5.2 uses a comparison of results from the 1994 IALS to the 2003 IALSS to provide a direct estimate of the changes in the average literacy scores of the adult population for a recent reference period. This comparison shows a mixed pattern of slight skill gain and loss by province with a slight decline in the average skills of the population aged 16 and over in Ontario.

Figure 5.2

Average literacy scores across selected regions and provinces, population aged 16 and over 1994 and 2003



Source: Statistics Canada and HRSDC, 2006.

The figure reveals an estimated 5 point decline in average skills of the entire adult population over the 9 year reference period. While not a statistically significant change the fact that this loss is observed in a period when rising educational participation should have precipitated an increase in skill is unexpected. In fact, higher graduation rates, shorter durations to secondary graduation, higher post-secondary participation at all levels, higher rates of formal and non-formal adult learning – would have been expected to raise average scores by roughly 25 points (CCL, 2008). A combination of offsetting adult skill loss, shifting demographic composition and falling secondary quality are perhaps the most likely candidates for this apparent 30 point drop in the expected level of skills (Willms and Murray, 2007). Determining the relative contribution of changes in secondary quality to this IALSS-based result is the central question for this volume.

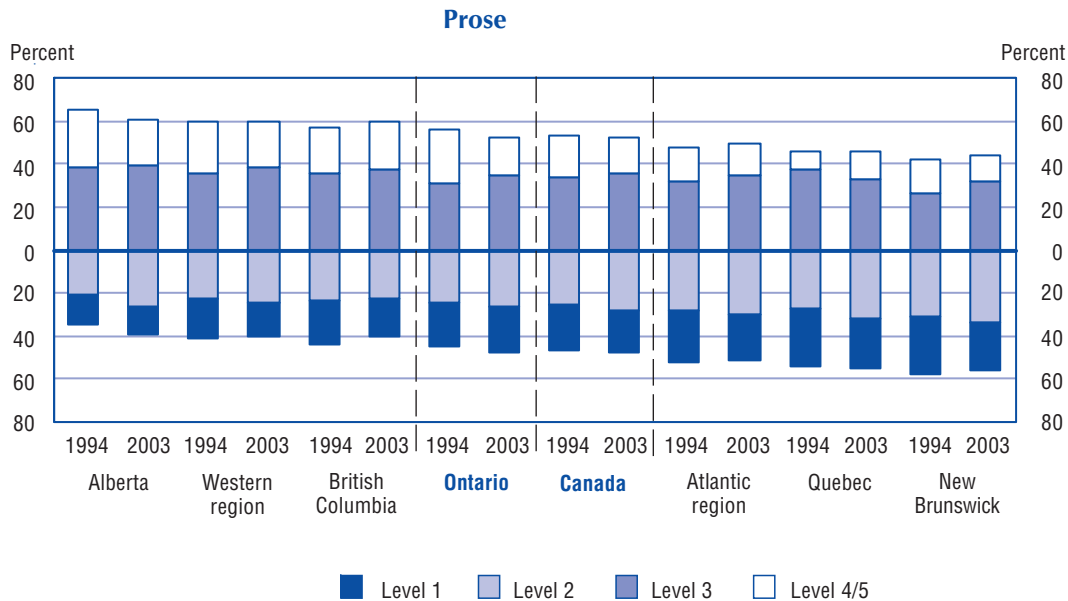
Changes in average literacy scores over time can conceal important shifts in the underlying distributions of skill. Analysis by one of the authors using data from Human Resources and Skill Development Canada's Essential Skills Profiles established that the majority of Canadian occupations require Level 3 literacy skills or higher (Murray and Shillington, 2009). Related analysis establishes that the average level of literacy skill demanded by the Ontario economy is likely to rise rapidly in response to shifts in the occupational distribution of employment and knowledge and skill intensification within occupations (Murray and Shillington, 2009).

Together these data suggest that Level 3 represents an important threshold, one that is needed to allow individuals to compete in the emerging global knowledge economy. Expert opinion also suggests that Level 3 is the minimum level needed to take full advantage of education at the post-secondary level (Statistics Canada and

OECD, 2005). Figure 5.3 presents the change observed in the proportions of adults aged 16 and over by proficiency level observed between 1994 and 2003.

Figure 5.3

Changes in the distribution of literacy levels across selected regions and provinces, population aged 16 and over, 1994 and 2003



Source: Statistics Canada and HRSDC, 2006.

The figure suggests that the proportion of adults at prose literacy levels 1 and 2 rose in Ontario by an estimated 3.6% over the period.

Although the declines are small, taken at face value these findings might be interpreted as evidence in support the hypothesized drop in the quality of secondary education in Ontario. The flow of literacy skill leaving the secondary system is, however, only one of several flows that serve to modify the stock of adult skill over time as indicated in the following text box.

Comparing cross-sections

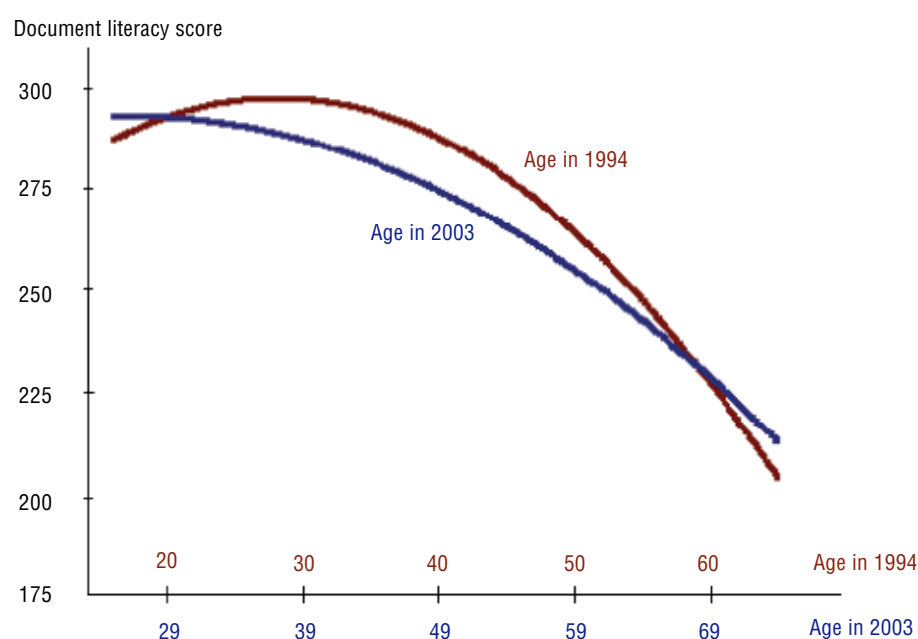
Research has shown that the processes of skill gain and loss operate over the entire life course. Some adults gain additional literacy skill after exiting the secondary system as a result of their participation in post-secondary education, in various forms of adult learning and through the use of reading skills at work. For others the reverse holds true and skill loss results (Bynner and Parsons, 1998). These processes of skill gain and loss serve to degrade the reliability of these data as a signal of secondary quality increasingly over time. The older the cohort the more time the processes of skill gain and loss have had to operate. The fact that the net impact of these processes varies significantly from province to province could be expected to render the resulting inter-provincial comparisons unreliable.

Comparison of estimates of literacy levels by province derived from the 1994 IALS and the 2003 IALSS studies reveals that the average literacy score of the population 16 and over remained unchanged over the reference period (Willms and Murray, 2007). This result was not expected as rising secondary graduation rates, post-secondary participation and graduation, rates of adult education and training and the knowledge-intensification of employment were expected to increase average scores by at least 25 points. Figure 5.4 below shows that the lack of progress at the national level can be traced back to the fact that significant skill loss eroded the skills of many adults, enough in fact to entirely offset expected skill gains.

The following two figures compare results from the 1994 IALS to the 2003 IALSS to provide direct estimates of the changes in the average literacy scores of the adult population for the same cohort of adults in Canada and Ontario. The objective of this analysis is to show how much skill loss in young adulthood might limit the utility of the IALSS cross-sectional comparisons as indicators of changes in the average quality of students leaving the Ontario secondary system.

Figure 5.4

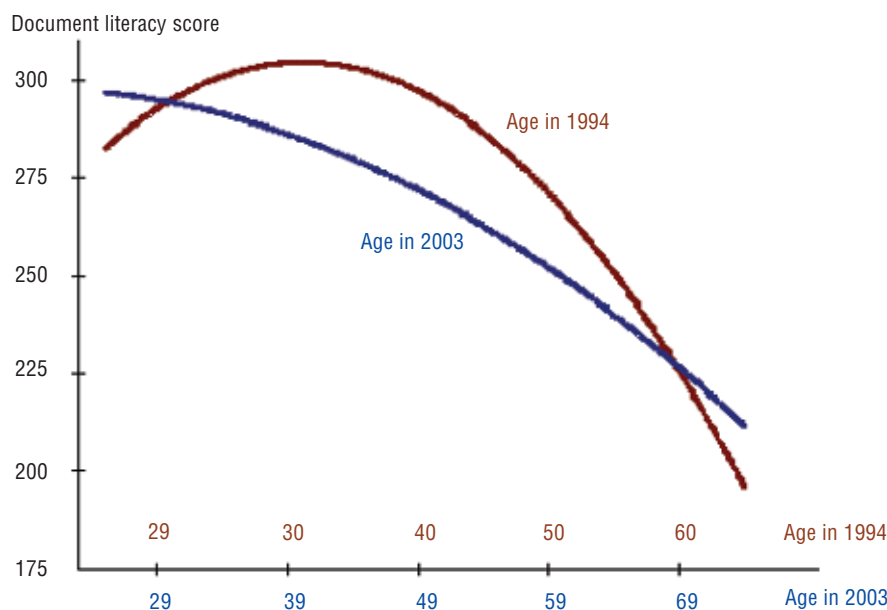
Average document literacy scores by age, 1994 and 2003, Canada



Source: Willms and Murray, 2007.

As expected skill loss is observed over the entire life course at the Canada level. The fact that skill gain and loss entirely offset each other at the national level would seem to support the utility of this data as an indicator of average secondary quality for the two most recent five year periods on average across Canada.

Willms and Murray (Willms and Murray, 2007) have shown, however, that the magnitude of skill loss varied significantly by province with some provinces realizing modest skill gain overall across the entire adult age range and other losing significant amounts of skill. The following figure reveals that Ontario adults experienced the highest level of adult skill loss of any province.

Figure 5.5**Average document literacy scores by age, 1994 and 2003, Ontario**

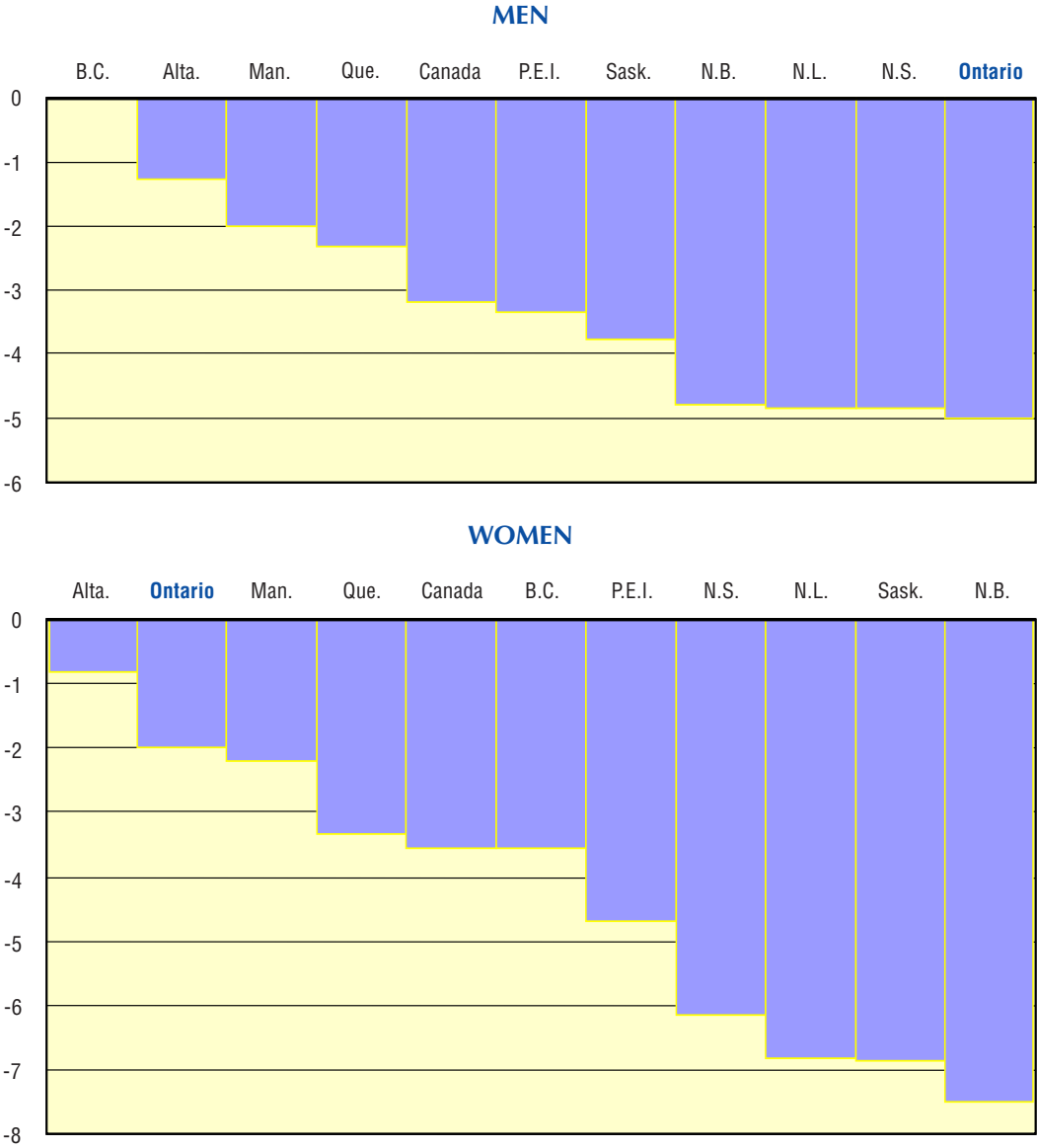
Source: Special analysis by Willms and Murray.

Adding this net skill loss back onto the average literacy scores of Ontario youth yields estimates for the two most recent periods that are better indications of the “true” score at the point of leaving the secondary system. Essentially these estimates have been “corrected” for signal attenuation since secondary leaving. According to these estimates the quality of Ontario secondary leavers has remained unchanged at least over the 9-year period 1994 to 2003 – a finding that corroborates the PISA results presented in Chapter 4.

Trends in secondary completion

Over the past decade provincial governments have invested considerable resources and effort in increasing rates of persistence to secondary graduation. These efforts have been rewarded – apparent rates of exit without receiving a diploma by aged 21 have declined in all provinces, with the largest reduction in rates for males realized in Ontario. Figure 5.6 displays the reduction realized in the rate of exit without qualification by province for men and women.

Figure 5.6
Reductions in rates of high school exit without qualification by province, age 21, 2000



Source: Youth in Transition survey, Cohort 18 to 20, 2000. Presentation to the CMEC Advisory Committee of Deputy Ministers of Education, 2000.

Assuming that there was no concomitant reduction of the graduation standard in Ontario, then the pool of post-secondary eligible secondary graduates has increased rapidly over the past decade.⁷ It is worth noting in passing that the elimination of Grade 13 in Ontario seems to have been accomplished without any evidence of a decline in quality. This suggests that Ontario realized a significant increase in educational productivity over the past decade.

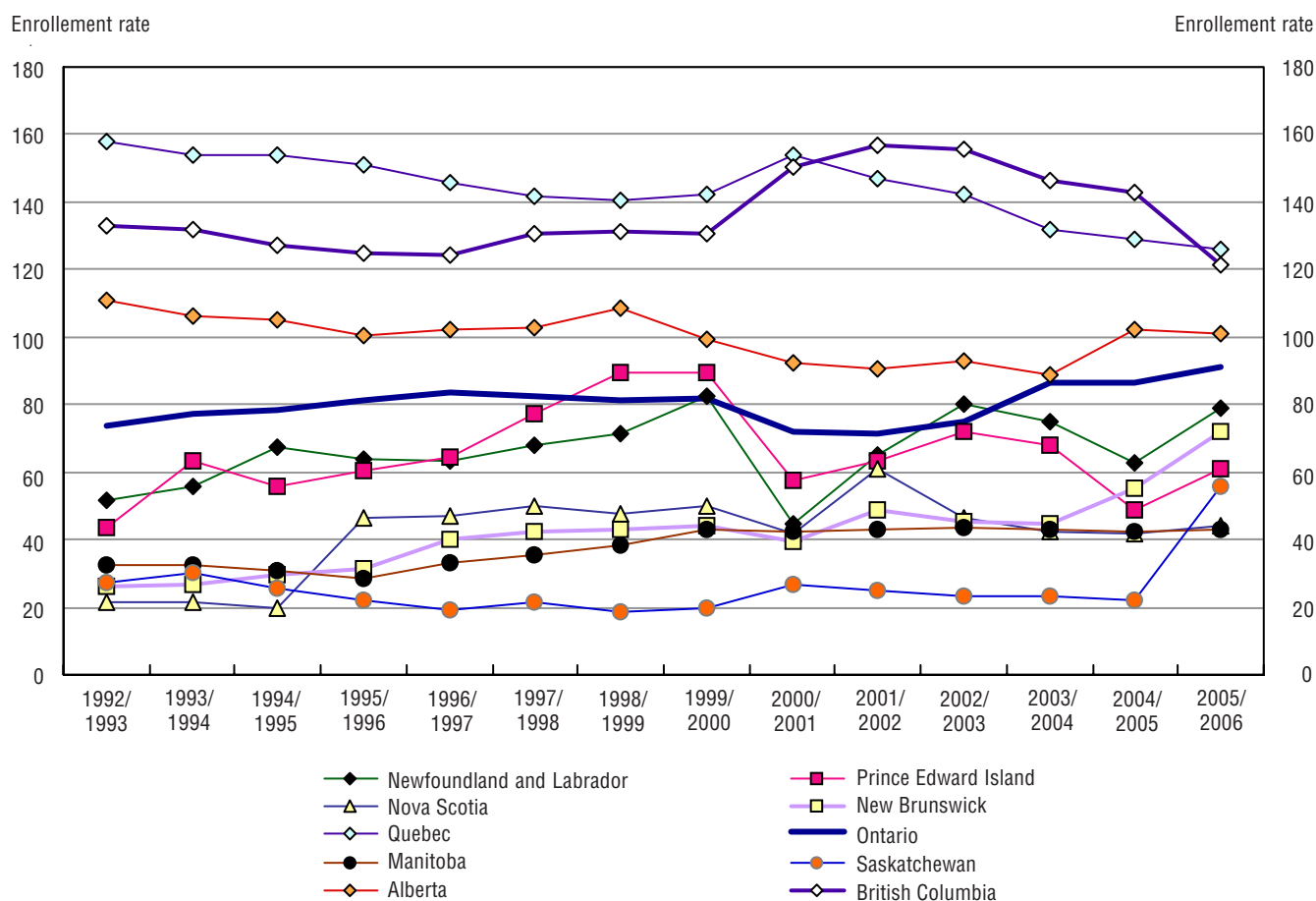
7. Ontario education data was not available to the researchers to update this information.

Trends in participation at the post-secondary level

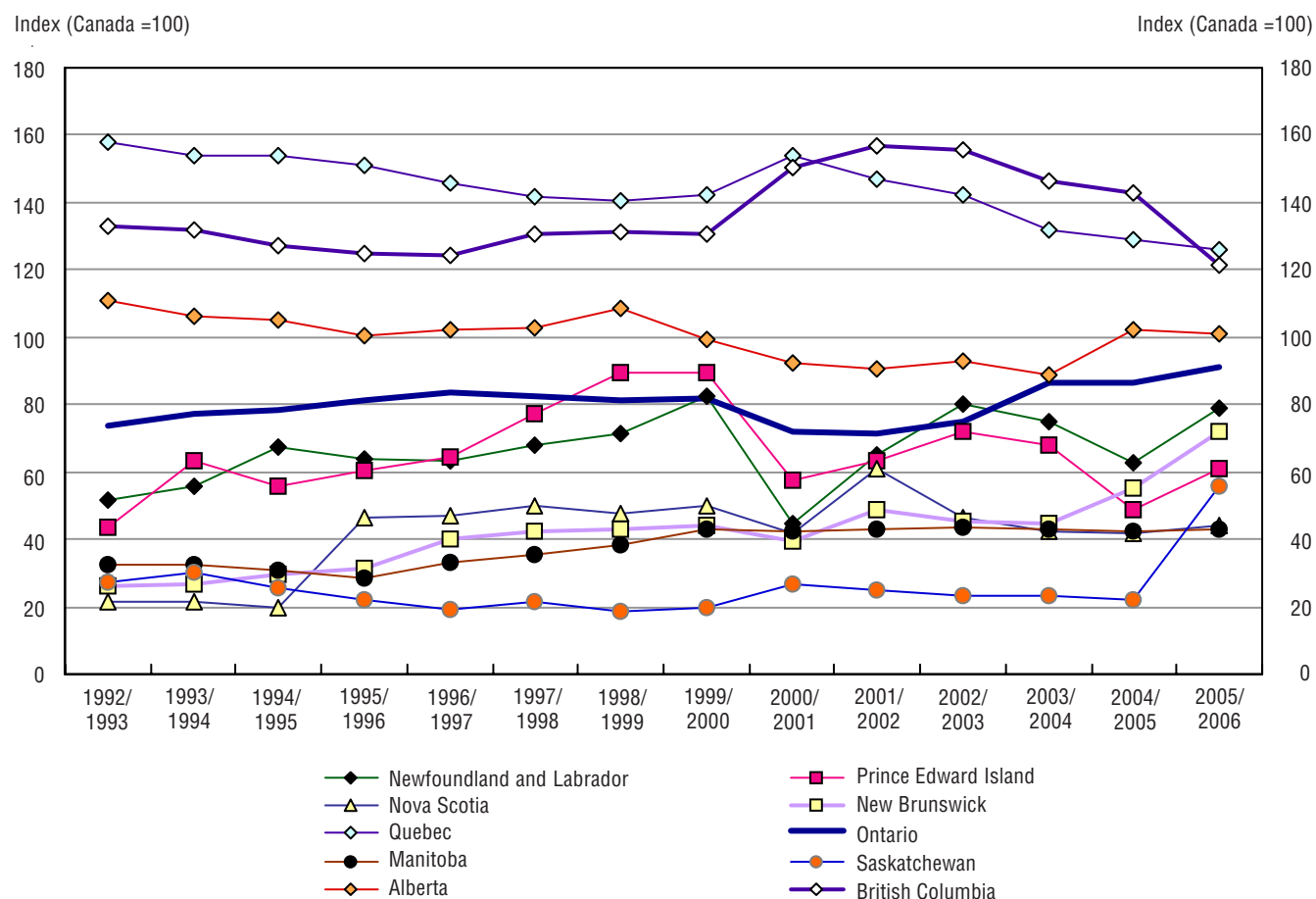
Participation in education at the post-secondary level has been growing rapidly over the past few decades in response to rapid increases in government funding. Given that both the PISA and IALSS analyses suggest that the quality of secondary graduates has been stable over the past decade it is possible that rising post-secondary participation has induced a decline in the average literacy skill level of post-secondary participants. The following charts plot long-term trends in college and university participation as percentages of the population aged 16 to 65 by province. The first chart presents absolute post-secondary participation rates, the second plots the trend in post-secondary participation rates relative to the national average at each reference period. The former chart provides some sense of how “deep” into the proficiency distribution post-secondary institutions are dipping, the latter a means to detect shifts in the relative participation rates among provinces over time. The charts reveal that Ontario has experienced one of the most rapid increases in both absolute and relative post-secondary participation, a finding that implies a relatively large decline in the skill of the least able post-secondary participants at both the college and university level.

Figure 5.7

Absolute rates of post-secondary participation at the college level by province, 1992-2007

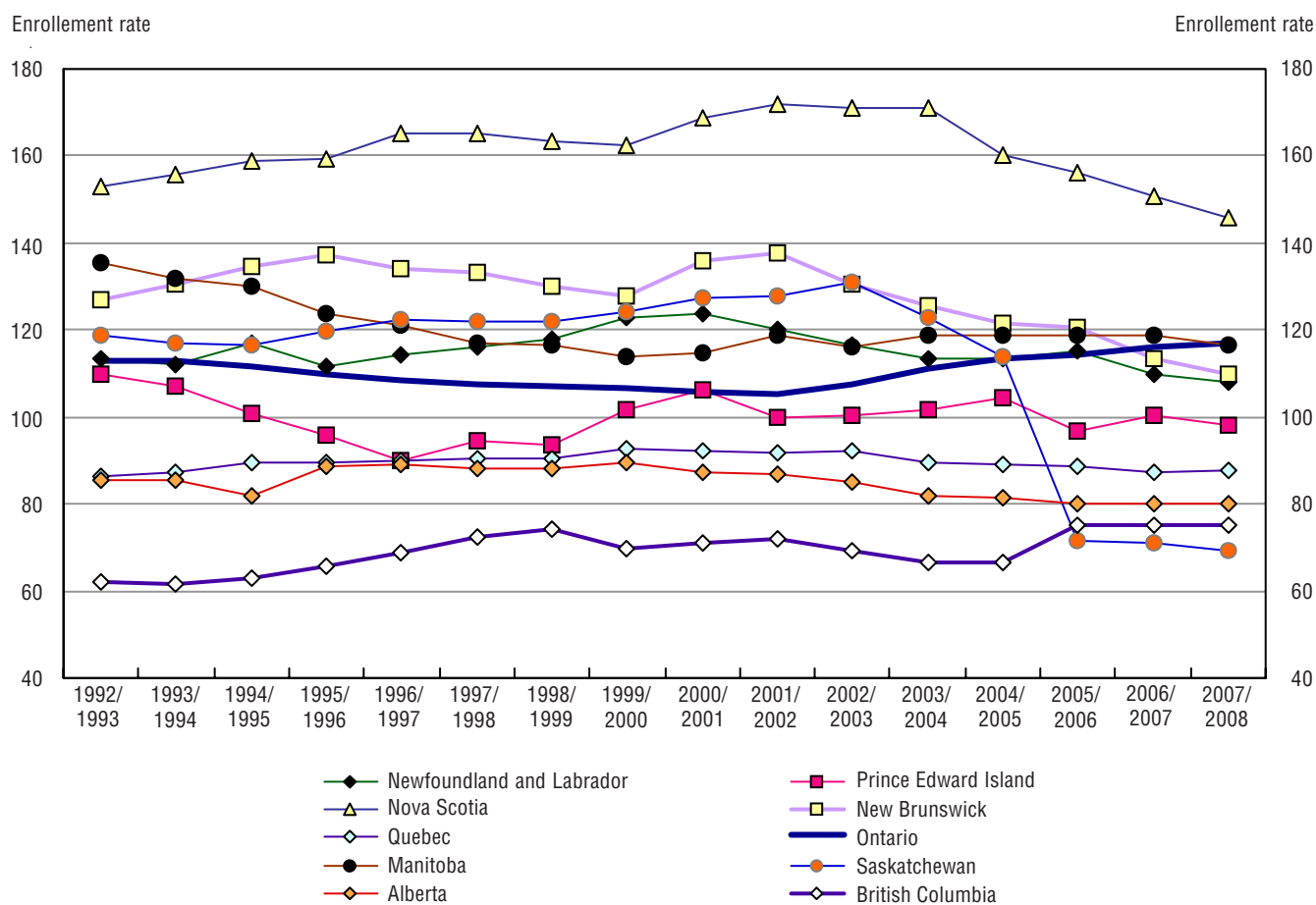


Source: Statistics Canada, PCEIP.

Figure 5.8
Relative rates of post-secondary participation at the college level by province, 1992-2007


Source: Statistics Canada, PCEIP.

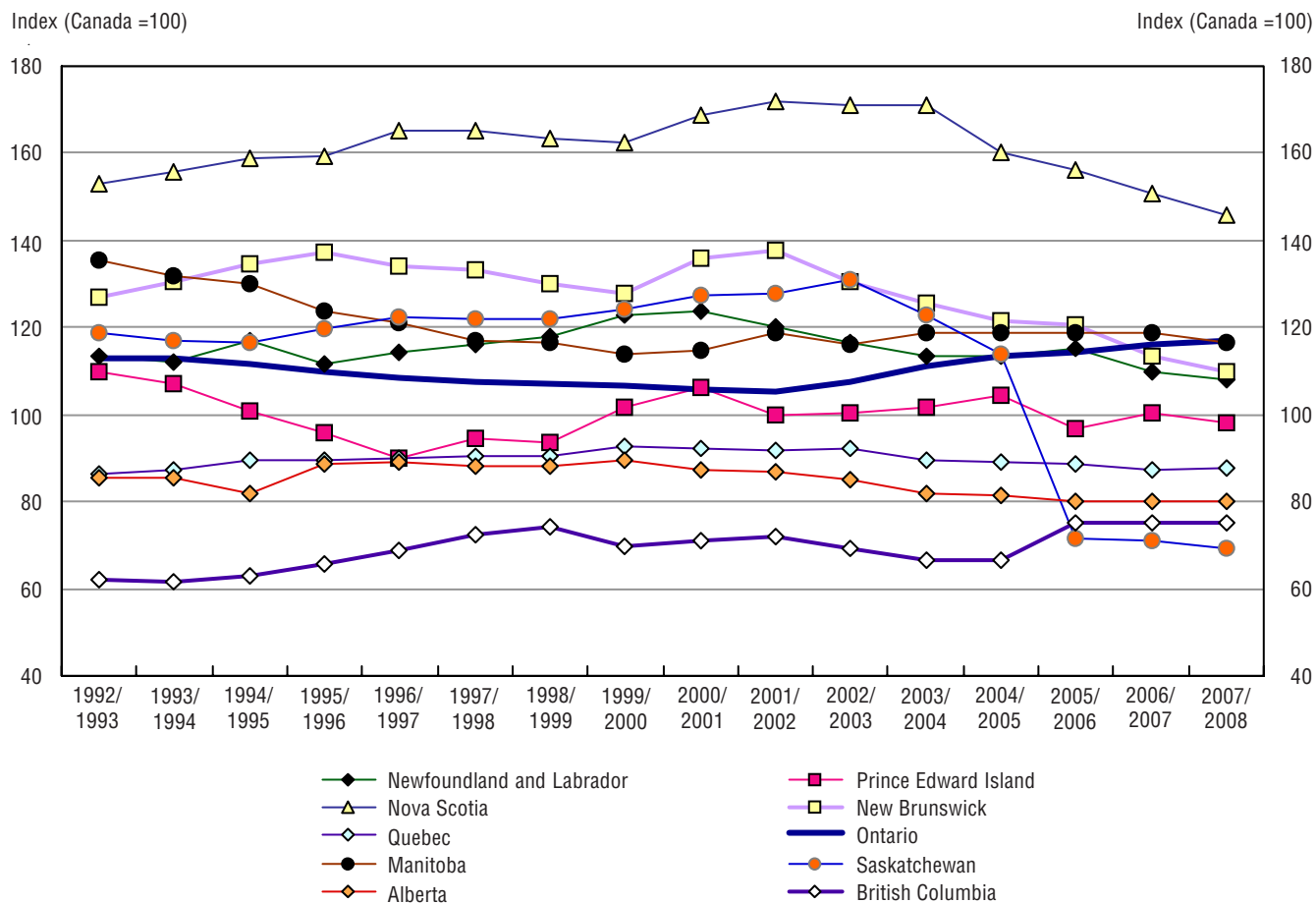
The two figures reveal that Ontario has one of the highest absolute rates of college participation and has experienced one of the highest rates of increase in college participation rates, from less than 80% of the national average to 90% of the national average in 2005/2006.

Figure 5.9**Absolute rates of post-secondary participation at the university level by province, 1992-2007**

Source: Statistics Canada and CMEC, PCEIP.

Figure 5.10

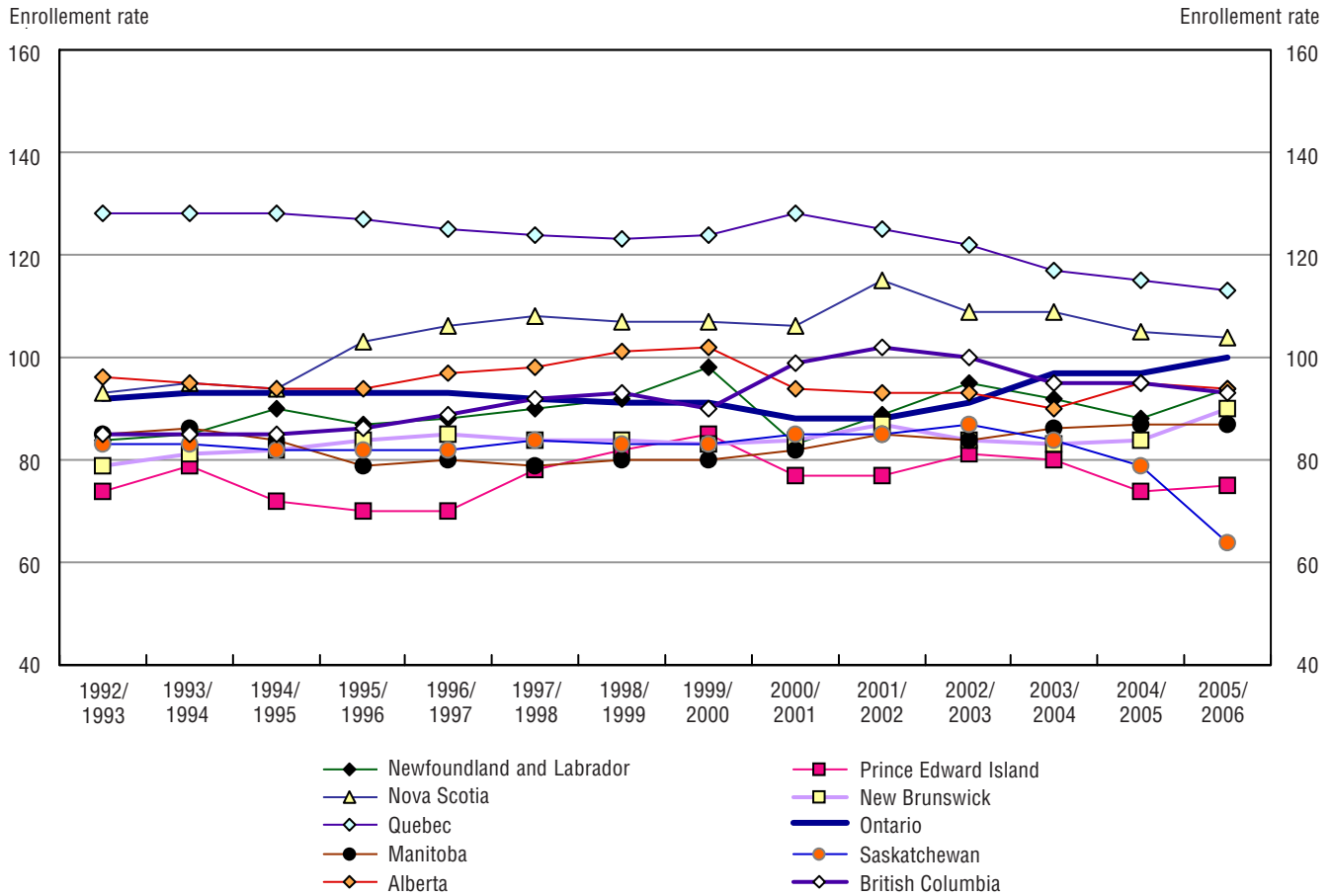
Relative rates of post-secondary participation at the university level by province, 1992-2007



Source: Statistics Canada and CMEC, PCEIP.

Figure 5.11

Rates of post-secondary participation at the university level and college level combined by province, 1992-2007



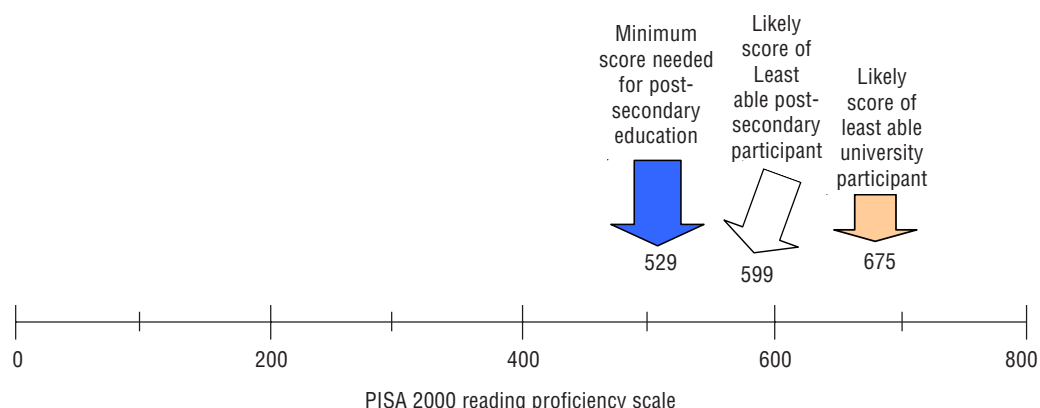
Source: Statistics Canada and CMEC, PCEIP.

The charts confirm that rates of participation have been growing rapidly over the reference period and that Ontario has experienced among the most rapid rates of growth.

Nevertheless the overall combined post-secondary participation rate by the end of the period is still less than 7% of the eligible population. Assuming for the sake of argument that the systems that allocate access to post-secondary institutions are perfectly efficient (i.e. they allocate the available post-secondary seats to the most able secondary students), and the fact that the skill level of the pool of students has been stable over time, then rising rates of participation imply that the last student admitted in successive cohorts of post-secondary participants will be less able. The following chart matches up the percentile distribution of PISA scores against the inverse rates of post-secondary participation. This chart shows the notional relationship between admission to study at the post-secondary level and the highest possible scores of the least able student under the assumption of a perfectly efficient admission system i.e. one that admits students from the most literate to the least literate.

Figure 5.12

Percentile distribution of PISA scores and implied minimum cut-off for post-secondary admission, all ages, Ontario, 2000



Source: PISA 2000 and PCEIP.

The chart reveals, all other things being equal, that the score of the least able post-secondary participant in Ontario at the end of the period at the university level would be 675 and at the college level would be 599. Thus, the least able Ontario college participant in the most recent period is likely to have 70 more points, and the least able university participant 149 more points, than the notional minimum. In both cases, these scores are only slightly lower than those observed at the beginning of the reference period. It is unlikely that post-secondary educators would be able to detect score differences this small so it is equally unlikely that decline in skill would have had a material impact on their perceptions of the relative quality of secondary graduates in Ontario.

In truth, the systems that allocate access to post-secondary are not perfectly efficient. The presence of inefficiency in the allocation system implies that some motivated but less skilled students will be admitted whilst some more skilled students will be excluded. Even allowing for significant inefficiency in the selection process it is unlikely, given the relatively low participations rates presented above, that large proportions of post-secondary participants lack the cognitive skills required to take full advantage of education at the post-secondary level.

Having established important trends in post-secondary participation the analysis turns to a review of the apparent quality of Ontario post-secondary students.

The foregoing charts focused on the enrollment of students at various ages. Reducing the focus to the two youngest post-secondary eligible age groups (ages 15 to 24; 25 to 34) sharpens the analysis. It could be the increases in enrollment observed for younger cohorts might differ from those observed for the entire population. If, for example, participation rates of younger cohorts have risen more rapidly than for the overall population, then the average literacy skill level of those admitted to study at the post-secondary level would have fallen.

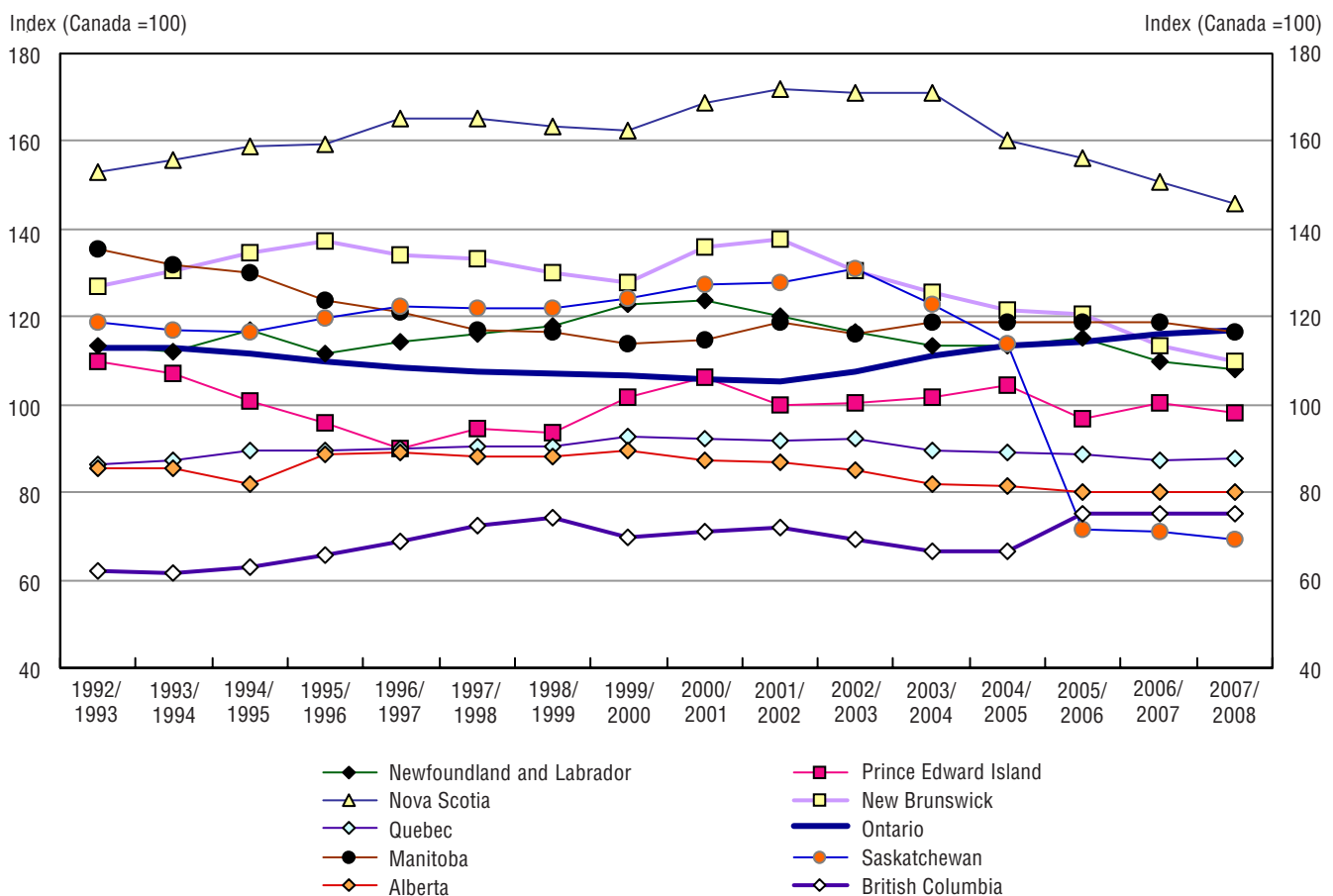
Recent relative trends in post-secondary participation

The foregoing analysis strongly suggests that the relative quality of the Ontario secondary system is high by national and international standards. More importantly the evidence seems to suggest a steady improvement in the relative quality of Ontario secondary output over the long term but relatively flat performance over the past decade. At the same time the PISA data reveal that significant proportions of Ontario 15 year olds demonstrate literacy scores below the level needed to support post-secondary education, 43% in the most recent period for which results are available⁸. Thus, any post-secondary participation rate above 57% implies the participation of significant numbers of low skilled students. The analysis now turns to a comparison of long-term trends in post-secondary participation at the college and university level for the cohort aged 15 to 24.

Figure 5.13 plots the long-term trend in university enrollment by province. Enrollment rates are displayed for 15 to 24 year olds relative to the national average. Comparison of enrollment to the national average at each time point removes the effect of changes in the overall average, a comparison that allows one to focus on shifts in the relative position of the jurisdictions over the period.

Figure 5.13

Relative university enrollment rates by province, youth aged 15 to 24 by province, 1992/1993-2007/2008



Source: Statistics Canada and CMEC, PCEIP.

8. See Figure 4.6

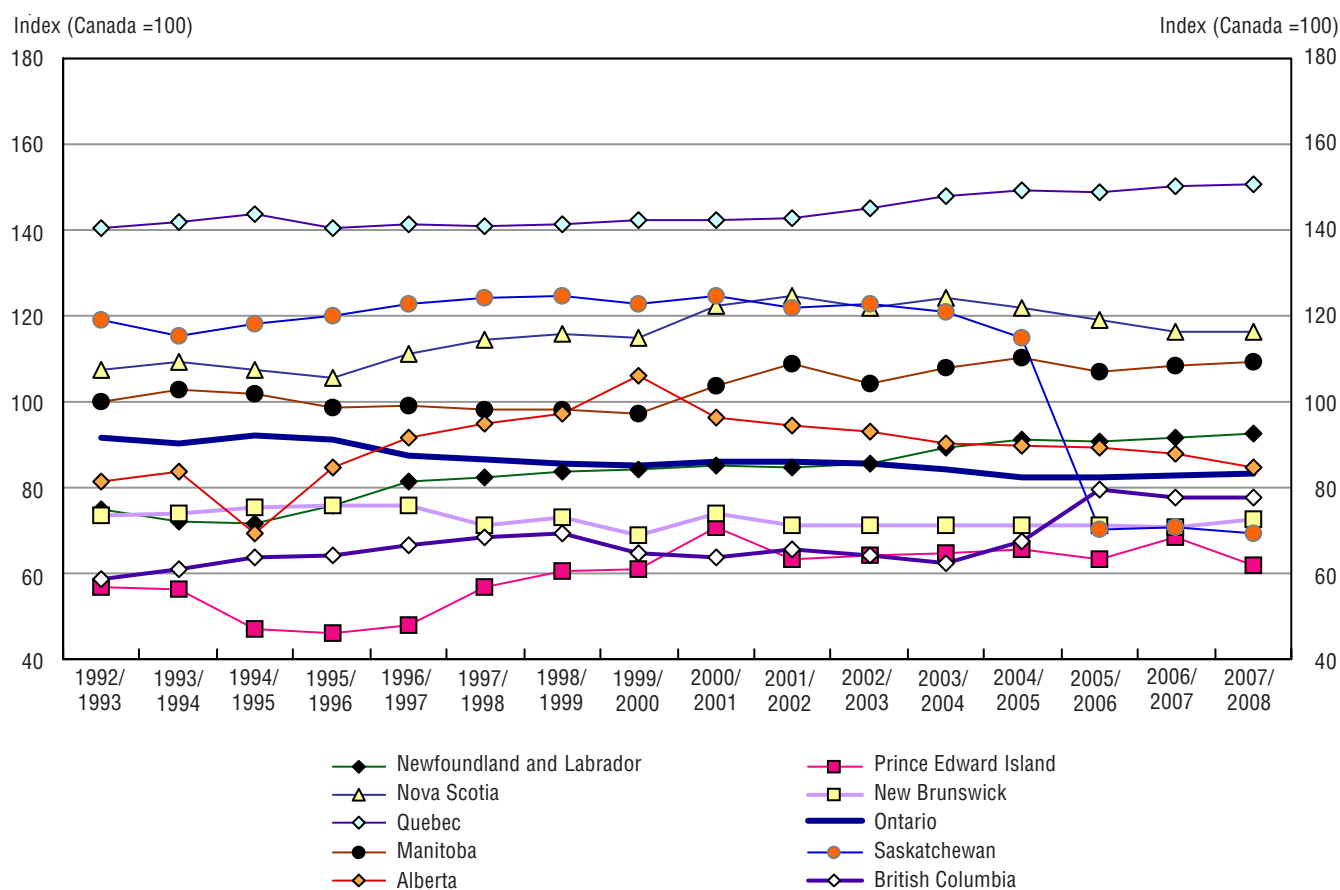
The figure reveals that after a period of secular⁹ (that is, long term) decline relative to the national average university participation rates in Ontario have risen rapidly. By the end of the reference period they sat 18% higher than the national average.

Such a rapid increase in relative university enrollment implies an equally rapid increase in the physical infrastructure and in faculty levels if quality is to be maintained. A failure of the system to match enrollment growth on these dimensions risks a deterioration in the quality of university instruction that would impact the perceptions of both students and more experienced faculty. Similarly, if the rate of enrollment growth outstrips the rate of improvement in the average quality of secondary school leavers then the inevitable result is that the average quality of participants will fall.

It might be that perceptions of quality are being coloured by rapid increases in the participation of older cohorts in university, including significant numbers of adults who left the secondary system without being granted a diploma. Figure 5.14 plots relative participation rates among 25 to 34 year olds.

Figure 5.14

Relative university enrollment rates by province, youth aged 25 to 34 by province, 1992/1993 and 2007/2008



Source: Statistics Canada and CMEC, PCEIP.

9. A trend is a putative prevailing course or tendency of a system to move in a particular direction over time. Trends can be classified as *secular* trends for long time frames, *primary* trends for medium time frames, and *secondary* trends lasting short times.

The figure reveals a steady decline in the relative university participation rates of this older age group. Barring a dramatic decline in the average skill level of those being admitted the participation of older cohorts is unlikely to underlie a real or perceived decline in the quality of secondary output.

The underlying data do not provide a means to compare trends in college participation by age group as institutions fail to report age for large proportions of college students.

Actual post-secondary participation rates for a recent cohort of students

While useful, the foregoing analysis of participation rates assumes that the admission system is perfectly efficient with respect to student's literacy skill and, more importantly, that secondary students enter immediately after leaving the secondary system. Both of these assumptions are unlikely to pertain in reality. The following analysis uses data from the Youth in Transition Survey (YITS) to profile the actual participation patterns of a single cohort of students that were aged 15 in 2000 up to the age of 21. The longitudinal design of the YITS allows one to compute the actual proportions of the cohort that had participated at the university and college levels that can be compared to the implied post-secondary participation rates presented above. More importantly the analysis provides actual post-secondary participation rates by the literacy skill level of the student observed at age 15.

Table 5.15 identifies the proportions of the 2000 cohort of 15 year olds that had participated in post-secondary education by age 21 by their reading proficiency at age 15.

Table 5.15**Proportions of the 2000 cohort of 15 year olds participating in post-secondary education by age 21 by reading proficiency at age 15, for Ontario**

Population counts and percentages by reading literacy proficiency level	University	College	Employed	Other	Total
Reading literacy proficiency					
PISA reading score below 529					
Population Counts	11,716	27,855	13,226	3,250	56,048
Standard error	3,338	4,730	4,003	1,769	7,264
Percentage	9.3	22.1	10.5	2.6	44.4
Standard error ¹	2.6	3.53	3.14	1.38	5.17
Row percentage	20.9	49.7	23.6	5.8	...
Standard error	5.68	5.85	6.24	2.97	...
Column percentage	20.2	60.1	74.5	80	...
Standard error	5.31	6.73	9.78	20.13	...
PISA reading score 529 or higher					
Population Counts	46,414	18,473	4,536	810	70,234
Standard error	7544	4252	1832	890	8,393
Percentage	36.8	14.6	3.6	0.6	55.6
Standard error	5.4	3.1	1.43	0.71	5.17
Row percentage	66.1	26.3	6.5	1.2	...
Standard error	6.28	5.44	2.56	1.27	...
Column percentage	79.8	39.9	25.5	20	...
Standard error	5.31	6.73	9.78	20.13	...
Total					
Population Counts	58,130	46,329	17,762	4,061	126,282
Standard error	8,183	6,495	4,339	1,947	8,540
Percentage	46	36.7	14.1	3.2	100
Standard error	5.71	4.43	3.35	1.52	0

... not applicable

1. The **standard error** of an estimate is the standard deviation of the sampling distribution associated with the estimation method. Standard errors provide readers with a sense of the magnitude of sampling error that is associated with an estimate, specifically the proportion of samples that would give a result that falls within 2 standard errors above and below the reported value.

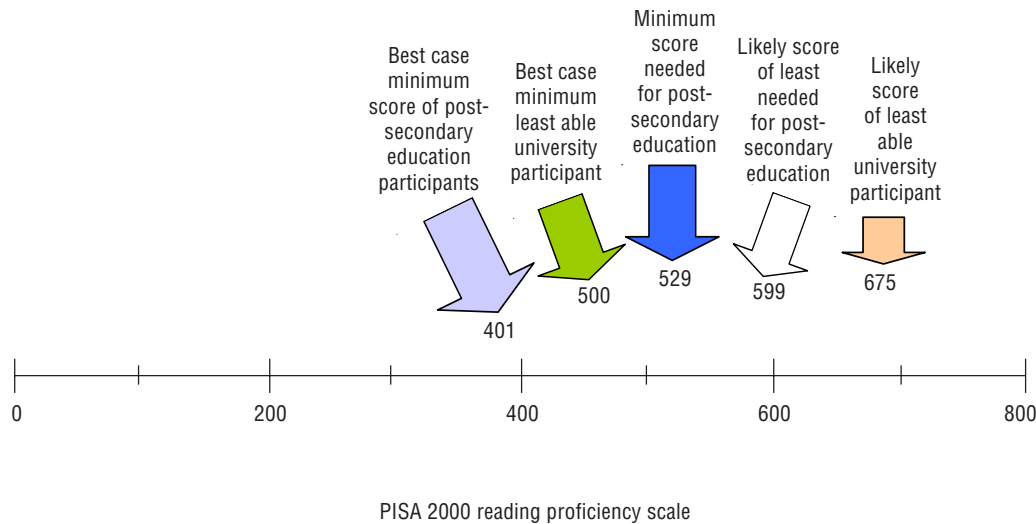
Source: Youth in Transition Survey, etc.

The figure reveals a dramatically different pattern than implied in the aggregate participation trends presented earlier in the chapter. Overall 46% percent of the cohort had participated at the university level and 36.7% at the college level for a total post-secondary participation rate of 83.7% by age 21. Were the admission process perfectly efficient this level of participation implies that the least able student admitted would have a PISA score of 538, well below the lower bound of IALSS Level 3. Under the same assumptions the least able university student would have a score of 500 on the IALSS scale.

The table shows that 9.3% of the cohort with skills below 529 attended university and 22.1% attended college, proportions that represent 20% and 60% of enrollment at these levels. These data confirm that post-secondary classes include significant numbers of students with low literacy skills even at the university level. Figure 5.16 translates these participation rates into “best case” scores of the least able student admitted. Assuming that students are admitted from the most to the least able then the least able university student would have a score of 508, 21 points below the acceptable minimum and the least able college student a score of 408, 121 points below the acceptable minimum. It may be the case that the presence of such large proportions of students is shaping the perceptions of faculty.

Figure 5.16

Percentile distribution of PISA scores and implied minimum cut-off for post-secondary admission by age 21, actual participation rates, Ontario, 2000



Source: PISA 2000 and PCEIP.

Literacy and post-secondary studies

The foregoing analysis established that a significant proportion of the students leaving Ontario's secondary education system have literacy scores that are lower than many believe are needed to take full advantage of education at the post-secondary level. This finding begs the question of how many of these students with IALSS Level 1 and 2 literacy skills are eventually admitted to post-secondary institutions.

The charts on trends in post-secondary participation revealed several findings of import to the current analysis, including:

- Post-secondary participation rates are high and rising.
- The rates of increase in post-secondary participation in Ontario are higher than observed in most other jurisdictions.
- By the end of period significantly more Ontario youth were participating in some form of post-secondary education, but still a slightly lower proportion than leave the secondary system with a diploma. The available evidence suggests that the actual proportion of students leaving the secondary system that are admitted by Ontario's post-secondary institutions greatly exceeds the proportion of secondary leavers who are notionally qualified for study at the post-secondary level. In many cases students are admitted despite having failed to be awarded a diploma or equivalent qualification. It is quite likely that the presence of these students is shaping post-secondary faculty's perceptions of the quality of the secondary system. It is also reasonable to assume that the presence of these low-skilled students is having a material impact on the returns that students and taxpayers are getting on their investments.

Chapter 6: To what extent does access to Ontario's post-secondary system depend on literacy skill?

The foregoing analyses document a rapid increase in Ontario's rates of post-secondary participation over the past two decades. At the same time, while the available evidence on student literacy scores suggests that the average quality of Ontario secondary quality is high, it is clear that a significant proportion of youth leaving Ontario's secondary system have literacy skills below that needed to take full advantage of post-secondary education at either the college or university level.

While it is true that many factors other than literacy skill influence admission to study at the post-secondary level our analysis focuses exclusively on literacy because of the profound effect it has on downstream educational and labour market outcomes such as rates of persistence to graduation, grades attained, receipt of a qualification, employment rate, wage rate and participation in various forms of adult learning,

A simple comparison of current post-secondary participation rates to the proportion of secondary leavers with IALSS Level 1 and 2 literacy skills makes it very likely that significant numbers of students leaving the secondary system with relatively low literacy skills are nevertheless being admitted by Ontario post-secondary institutions. Data from Statistics Canada's and Human Resources and Skills Development Canada Youth in Transition Survey (YITS) confirm that significant proportions of students with low literacy skills are being admitted to both the university and college systems.

Table 5.15 in Chapter 5 showed that 9.3% of a recent cohort with skills below 529 attended university and 22.1% attended college, proportions that represent 20% and 60% of enrollment at these levels. These data confirm that post-secondary classes include significant numbers of students with low literacy skills even at the university level. The current analysis uses these same YITS data to further explore the efficiency of Ontario's post-secondary admission systems. More specifically the analysis explores the degree to which access to various levels of the Ontario system is conditioned or influenced by student literacy skill.¹⁰ The underlying hypothesis is that the probability of secondary graduation and admission to post-secondary studies should rise with literacy level. The analyses provide estimates of the likelihood of an individual

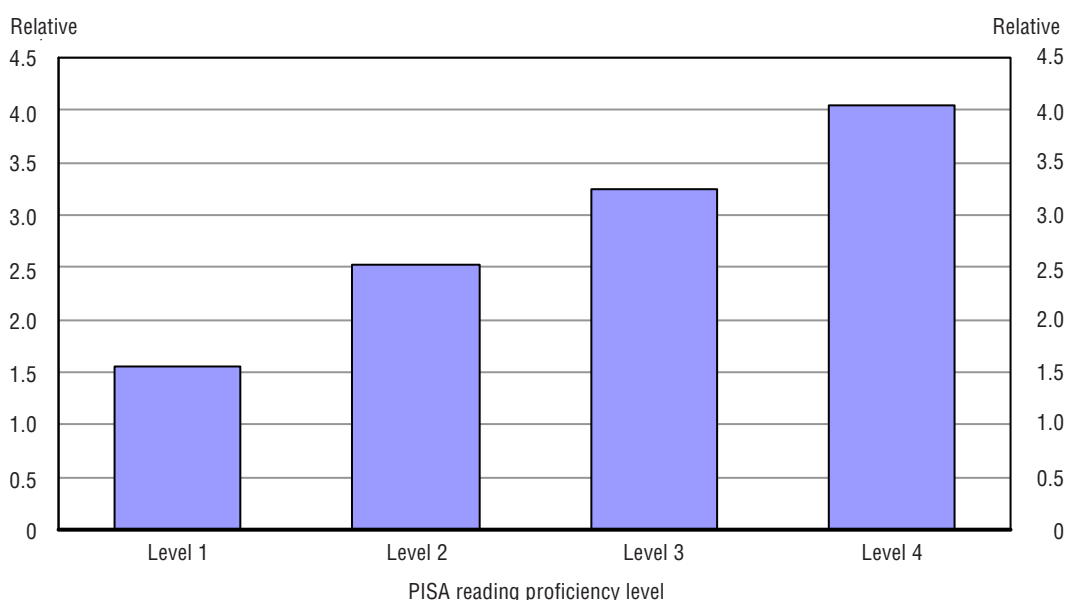
10. This chapter uses the term "conditioned by" to reflect the impact that low literacy skill has on the conditional probability of high school graduation and participation at the college and university level.

experiencing an outcome relative to a benchmark group – in this case the two lowest two literacy skill levels identified in the PISA assessment. Results take the form of “Group A is X times more likely than the comparison group to experience the outcome of interest”. The intent of the analysis is to show how much more likely are students with IALSS Level 3 and above skills to graduate from high school and to be admitted to either college or university.

Figure 6.1 plots the likelihood of high school graduation by the age of 21 by the level of literacy skill observed by PISA at the age of 15. This analysis is intended to empirically test what common sense would suggest i.e. that the probability of receipt of an Ontario high school matriculation rises with student literacy skill.

Figure 6.1

The likelihood of completing high school by age 21 by reading proficiency levels at age 15, Ontario 2006



Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

The results presented compare the relative likelihood of completing high school by the age of 21 to a benchmark level, in this case a combined Below Level 1 and Level 1.

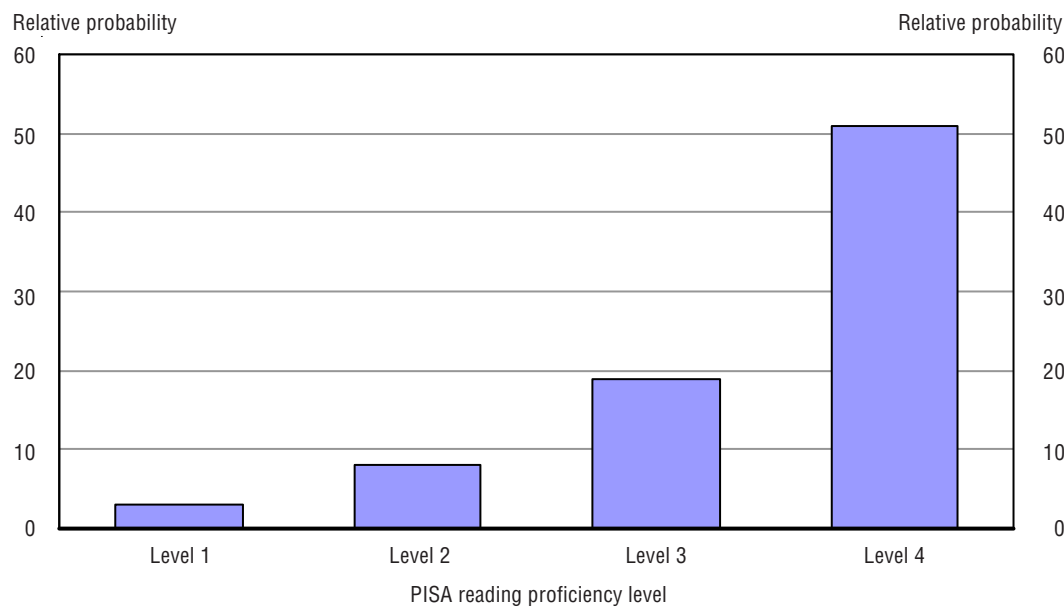
As anticipated, the Ontario secondary system is highly selective, in the sense that the probability of obtaining a diploma rises dramatically with PISA literacy level. For example, students who were classified at PISA Level 5 at age 15 in 2000 were over four times more likely to graduate than those students classified at the “Below Level 1 or Level 1” proficiency level. This finding confirms the expected results i.e. that the probability of high school graduation rises with literacy skill level at a steady rate.

Figure 6.2 plots the likelihood of post-secondary participation by the age of 21 by the level of literacy skill observed by PISA at the age of 15. The goal of this analysis is to test the selectivity of Ontario’s post-secondary institutions with respect

to literacy skill. More specifically the analysis provides empirical estimates of how more likely progressively more skilled students are to be admitted to Ontario's post-secondary institutions than their less literate peers.

Figure 6.2

The likelihood of post-secondary participation by age 21 by reading proficiency levels at age 15, Ontario, 2006



Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

The figure suggests that the Ontario post-secondary system appears to be even more selective with respect to literacy skill than the secondary system, in the sense that the probability of post-secondary participation increases even more dramatically with literacy level. For example, students who were classified at PISA Level 5 at age 15 in 2000 were over fifty times more likely to participate than those students classified at the PISA “Below Level 1” or “Level 1” proficiency level.

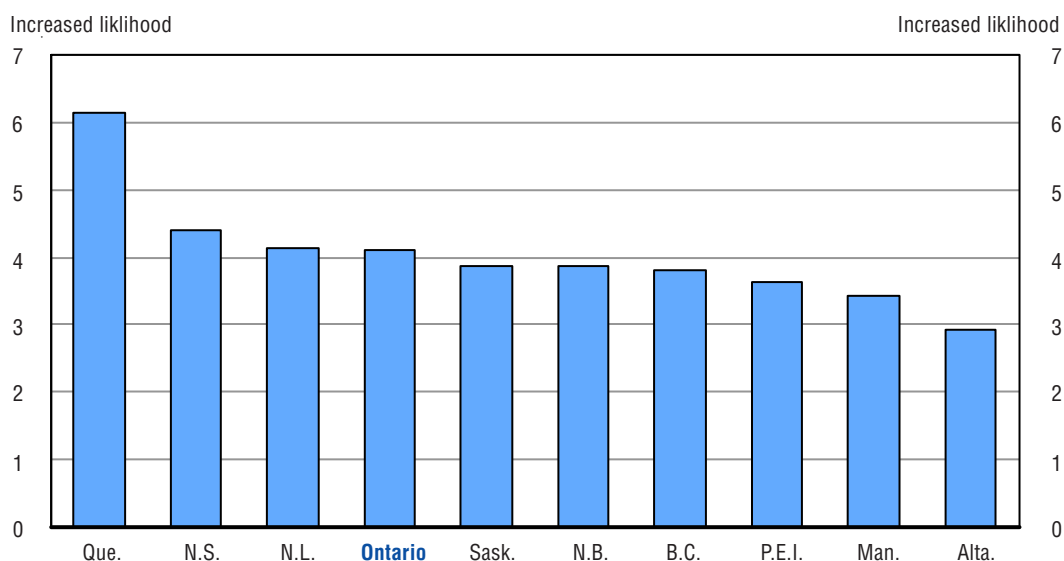
Together these two figures confirm that high school graduates have much higher literacy skills than those students who had yet to be granted a diploma by age 21, that the probability of high school graduation rises with literacy skill and that access to Ontario's post-secondary system is highly influenced by student literacy skill. The probability of participation rises steadily with student literacy level, with the most skilled students exhibiting the highest rates of participation.

Comparing the literacy selectivity of jurisdictions' post-secondary systems

The following chart plots by province how much more likely youth at age 15 with PISA literacy scores above 529 (IALSS Level 3) are to participate in education at the post secondary level than their counterparts with scores under 529 (IALSS Levels 1 and 2).

Figure 6.3

The relative likelihood of post-secondary participation by age 21 for youth with literacy skills above 529 at age 15, by province, 2006



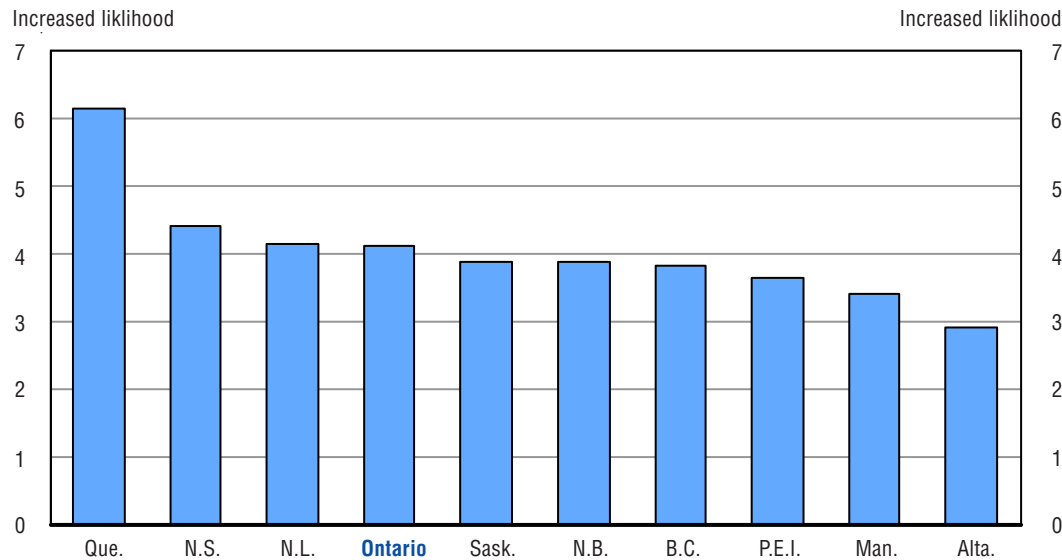
Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

Ontario does not appear to stand out from the other provinces in this regard. Ontario youth with IALSS Level 3 or above being 4 times more likely than students classified at IALSS Levels 1 and 2. Judged by the magnitude of the increase in the likelihood of admission associated with literacy skill, Quebec's admission standard appears to be significantly more demanding. Level 3 and above youth in Quebec are over 6 times more likely than their lower-skilled peers of having been admitted to post-secondary education by age 21.

The following figure compares the relative likelihood of universities admitting students with literacy scores above 529 compared to their college peers by province.

Figure 6.4

The relative likelihood of post-secondary participation at the university level by age 21 for youth with literacy skills above 529 at age 15, by province, 2006



Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

The figure reveals that Ontario's universities are 5.85 more likely to admit students with IALSS Level 3 or above literacy skills than Ontario colleges. Thus, by this standard, Ontario is the most demanding in terms of literacy-based admission standards compared to their college peers in other provinces.

The foregoing four figures provide several important findings. They confirm that:

the probability of receipt of a secondary diploma is highly dependent on literacy skill level, with more skilled youth displaying much higher rates of receipt.

the probability of admission to study at the post-secondary secondary level is even more highly dependent on literacy skill level, with more skilled youth displaying much higher rates of participation.

the probability of youth with literacy skills at IALSS level 3 or above is considerably higher than those with literacy skills at IALSS levels 1 and 2.

admission to the university system is significantly more selective than the college system with respect to literacy skills.

Collectively these figures confirm that the Ontario secondary and post-secondary systems are relatively efficient in the sense that the receipt of a diploma and access to study at the post secondary level are based to a large extent on students' literacy skill levels.

There is, however, one result that suggests that youth with literacy skill below IALSS Level 3 are nevertheless being admitted by Ontario post-secondary institutions. Additional data from the YITS study that suggests that a significant proportion (16%) of those leaving high school without receiving a diploma have participated in some form of post-secondary education by the age of 21.

This latter observation opens the possibility that the perception of falling secondary quality expressed by many post-secondary educators may, in fact, be a result of their own institution's behavior. Thus, the analysis now turns to other factors that might underlie a perception of falling secondary quality.

Chapter 7: Changes in the delivery of post-secondary education

The evidence presented in earlier chapters eliminates the possibility that falling student skill is responsible for the perception that secondary quality is falling. Current post-secondary participation rates are, however, sufficiently high to guarantee the presence of significant numbers of students with literacy skills below the level believed to be needed to take full advantage of instruction at these levels. Chapter 3 enumerates a large number of other factors that might be at play. Many of these other factors involve changes in how post-secondary education is delivered that might reduce the motivation levels of students and their opportunity to learn. One of the few factors for which there is data is the ratio of students to faculty at the university level.

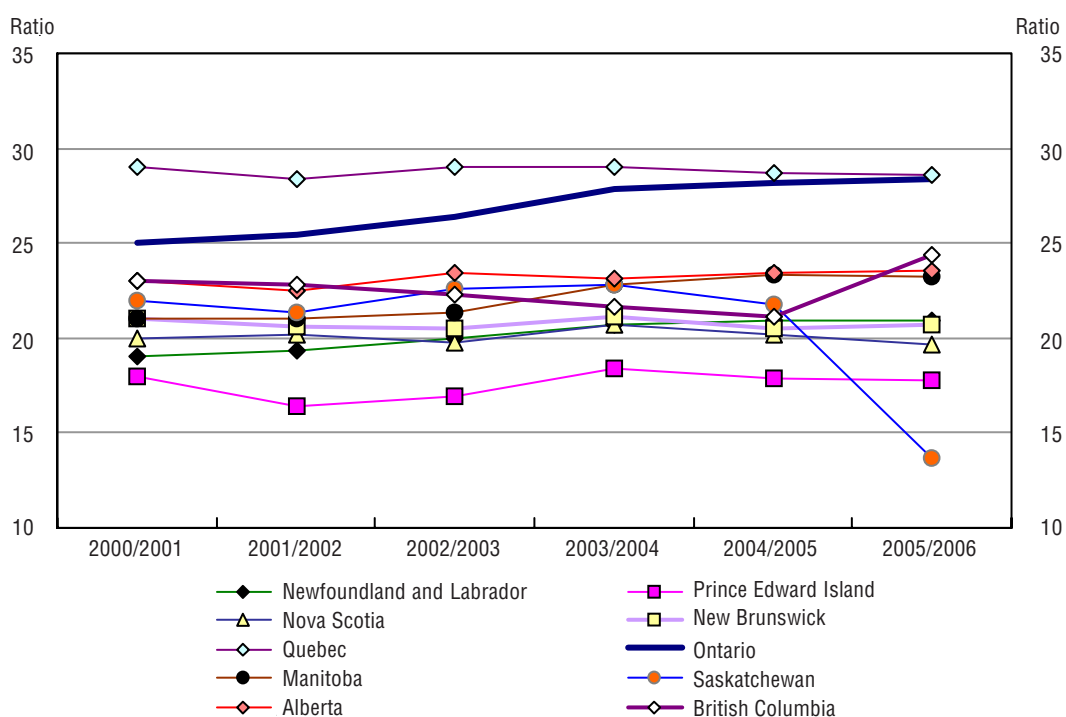
Data on government expenditures on post-secondary education suggest that reductions in funding created budget problems for the institutions (Association of Universities and Colleges of Canada 2010). Institutions responded to these budgetary pressures in several ways including increasing enrollment, increasing tuition levels and increasing student/teacher ratios in undergraduate programs. Simple arithmetic suggests that rapid increases in overall participation rates imply a decline in the average literacy level of the additional admissions.

Rapid increases in tuition should have served to raise the level of student motivation and are likely to have raised student expectations concerning the quality of delivery and increased pressure on faculty to perform.

Rapid increases in class size might be expected to reduce the quality of instruction and/or the amount of student/teacher interaction, both effects that would raise the level of pressure on faculty.

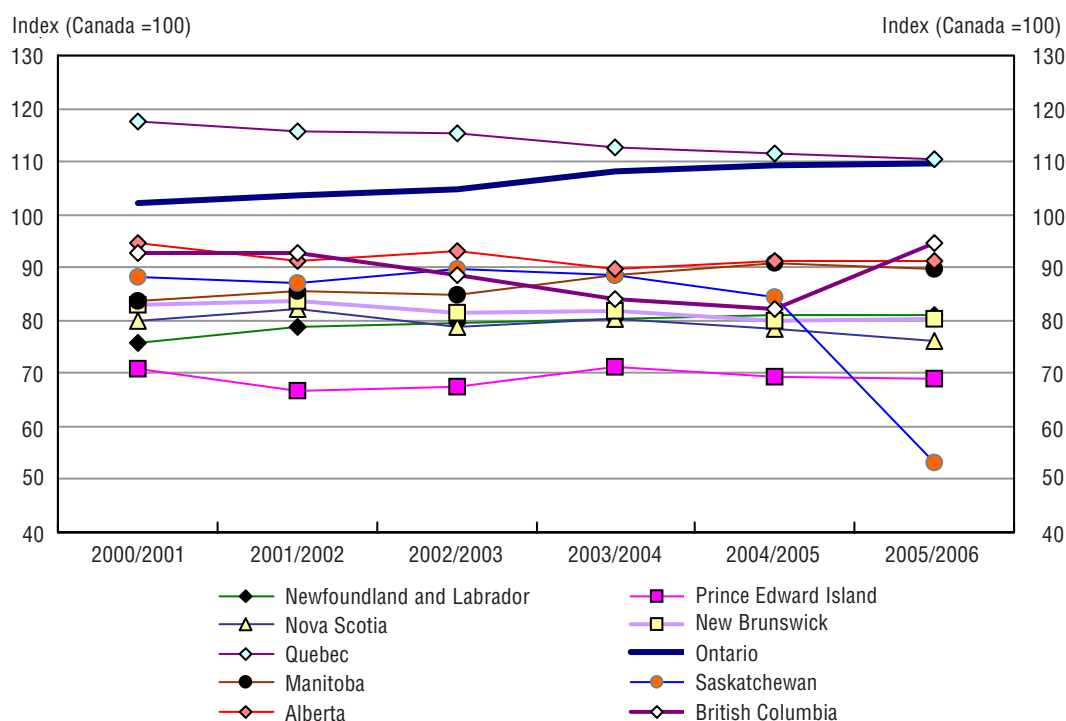
Figures 7.1 and 7.2 display the trend in university student/faculty ratios in absolute and relative terms.

Figure 7.1
University Student/Faculty Ratio by province, 2000/2001 and 2005/2006



Source: Statistics Canada and CMEC, PCEIP.

Figure 7.2
Relative University Student/Faculty Ratio by province, 2000/2001 and 2005/2006



Source: Statistics Canada and CMEC, PCEIP.

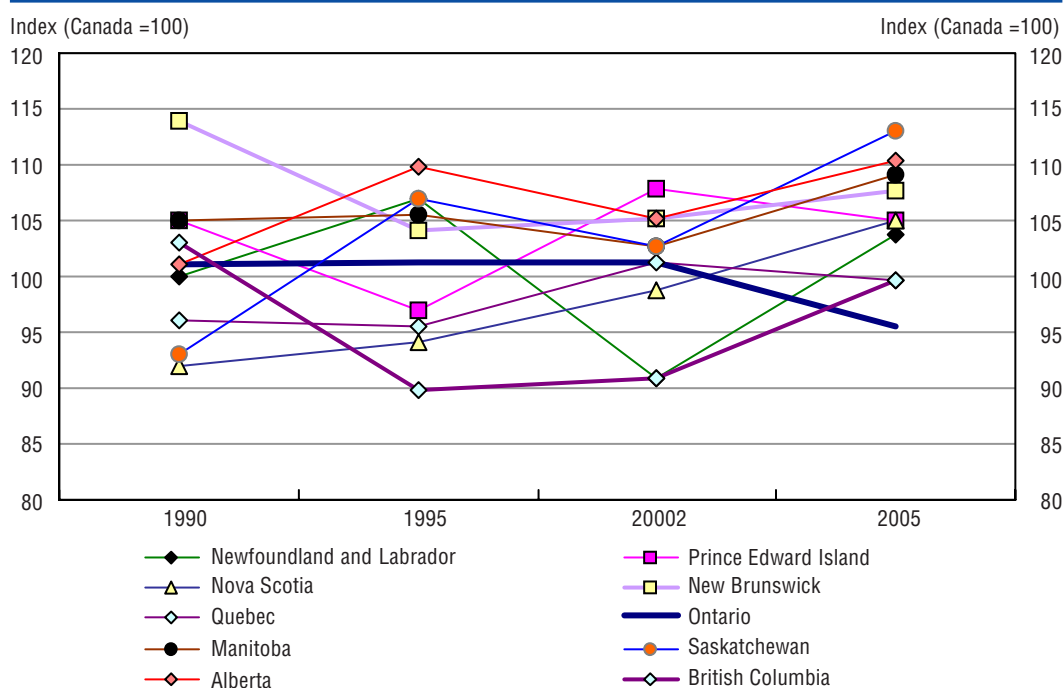
The trend revealed is clear, i.e., that Ontario has experienced the most rapid increase in the relative student/faculty ratio, with the result that the province now has the highest ratio in the country. Unfortunately colleges have not provided similar data to Statistics Canada for college faculty.

In view of these data there is a real possibility that more recent cohorts of university students have had less access to faculty. This likelihood, combined with the fact that tuition costs have been rising rapidly for these same cohorts at a time when wage returns to post-secondary education have been falling, might have the effect that these students have become more demanding than previous cohorts. More demanding students might place post-secondary institutions under additional stress, a much more likely source of the perceived decline in the quality of secondary output in Ontario.

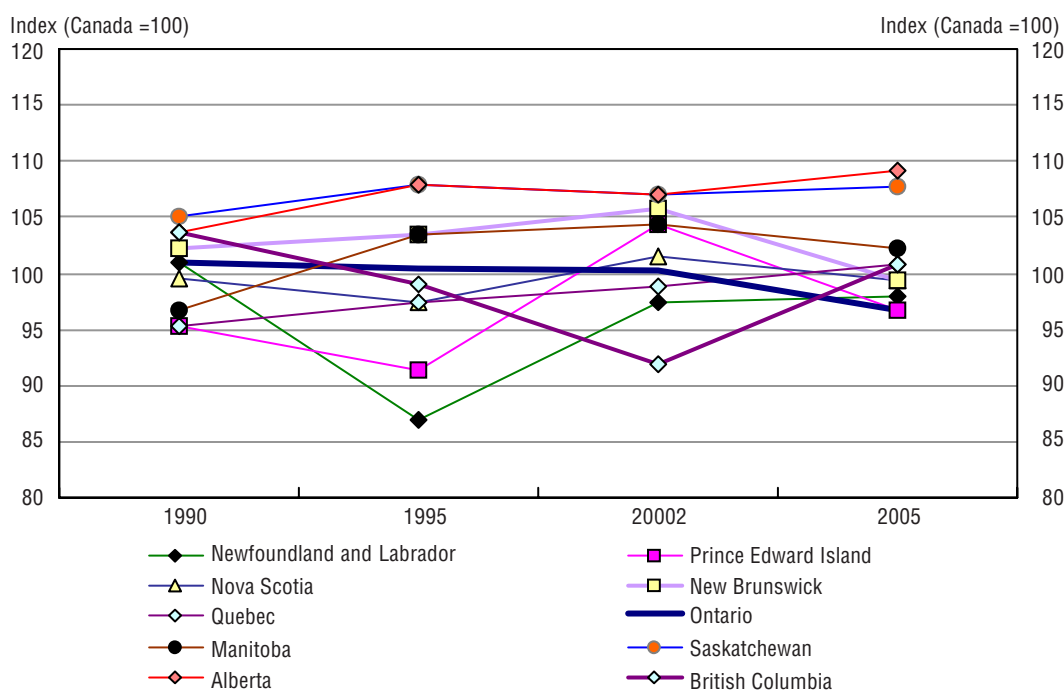
Chapter 8: Trends in the labour market outcomes of Ontario post-secondary graduates

The foregoing analysis focused largely on trends in enrollment and on apparent trends in educational quality using data on reading literacy. The analysis now shifts to examine trends in the relative labour market outcomes realized by Ontario post-secondary graduates. The critical assumption underlying this exploration is that, were secondary and post-secondary quality on the decline in Ontario, one would expect to see a concomitant decline in the relative economic success Ontario post-secondary graduates. Figures 8.1 through 8.4 below use data from successive cohorts graduates surveyed in Statistics Canada's National Graduates Survey (NGS) (Statistics Canada, 2007). Separate estimates are presented for colleges and universities as one might expect college labour market outcomes to be more sensitive to shifts in the skill of graduates.

Figure 8.1 presents data on full-time employment rates for college and Bachelor graduates for four cohorts: 1990, 1995, 2000 and 2005. The trend lines have been standardized to show changes in level relative to the national average at each point.

Figure 8.1
Full-time employment rate by province for those having completed a college program in 1990-2005


Source: Special analysis of Statistics Canada's National Graduate Surveys .

Figure 8.2
Full-time employment rate by province for those having completed a Bachelor's program in 1990-2005


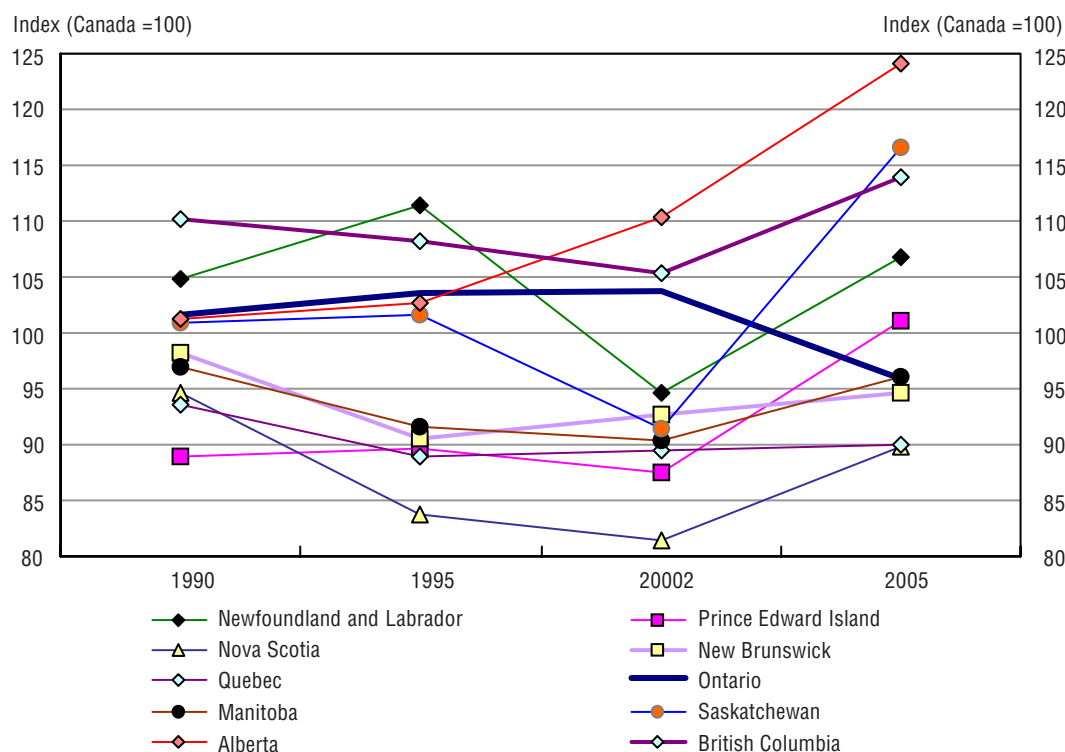
Source: Special analysis of Statistics Canada's National Graduate Surveys.

The figures reveal that for both college and Bachelor's graduates the relative full-time employment rates deteriorated significantly between the 2000 and 2005 cohorts. Such deterioration might indicate a decline in the quality of incoming cohorts but there are several other possible explanations that might pertain.

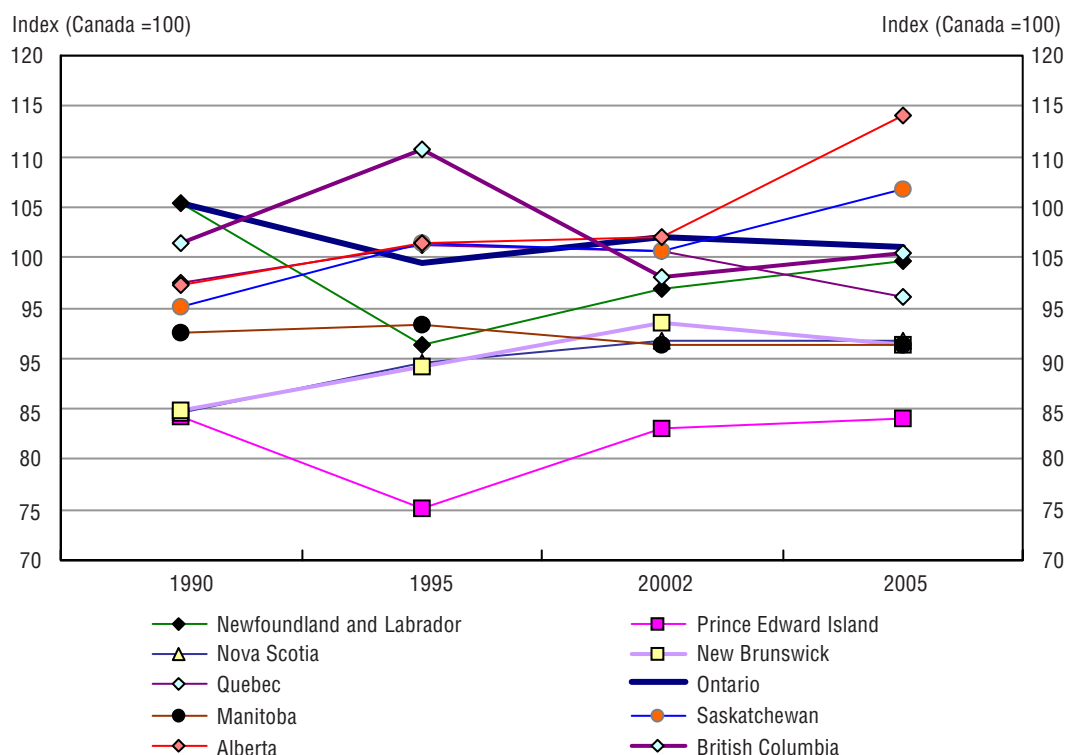
Figure 8.3 presents data on average wage rates for college and Bachelor's graduates for the same four cohorts: 1990, 1995, 2000 and 2005. Again the trend lines have been standardized to show changes in level relative to the national average at each reference period.

Figure 8.3

Relative average wage rates for college graduates, 1995-2005, by province



Source: Special analysis of Statistics Canada's National Graduate Surveys.

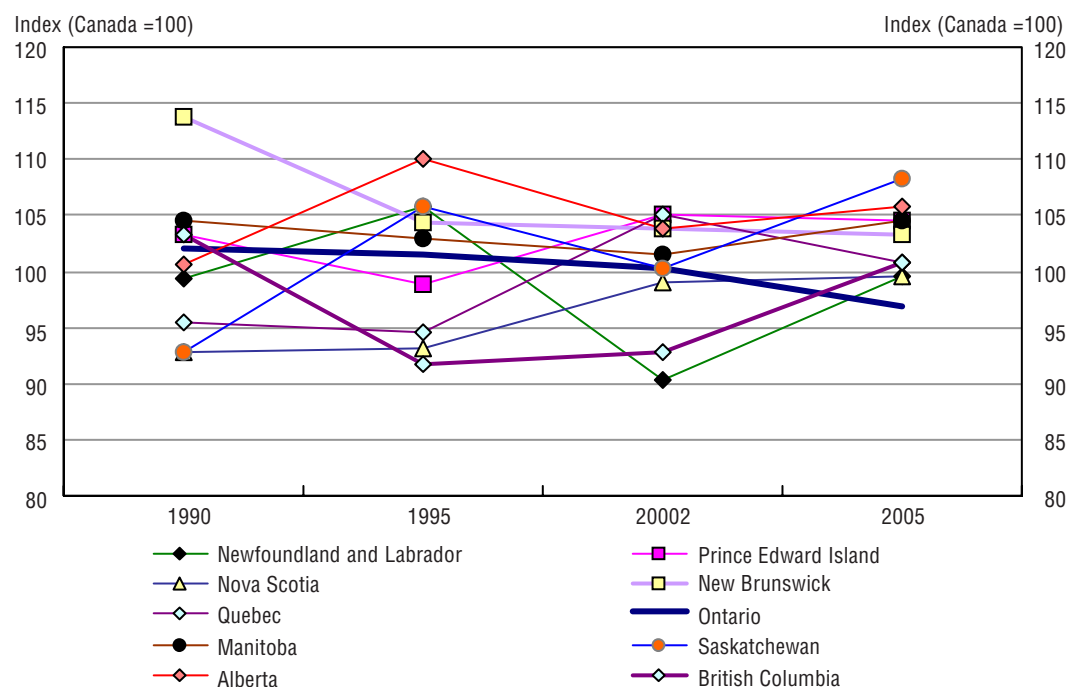
Figure 8.4**Relative average wage rates for Bachelor's graduates, 1995-2005, by province**

Source: Special analysis of Statistics Canada's National Graduate Surveys.

The figures reveal much the same pattern as was observed for full-time employment rates. For both college and Bachelor's graduates the relative wage rates deteriorated significantly between the 2000 and 2005 cohorts. The deterioration is particularly marked for Ontario college graduates. Again such deterioration might indicate a decline in the quality of incoming cohorts but there are several other possible explanations that might pertain. One of the possible explanations might be that higher fractions of Ontario graduates might be going on to pursue further education than in other jurisdictions. If it can be assumed that the most able graduates are selected for further study then one would expect to see the observed decline in labour market outcomes of those students who go directly in to the labour market. Figures 8.5 and 8.6 display trends in full-time employment for the same four cohorts of college and Bachelor's graduates but this time restricted only to those graduates who did not go on to further education.

Figure 8.5

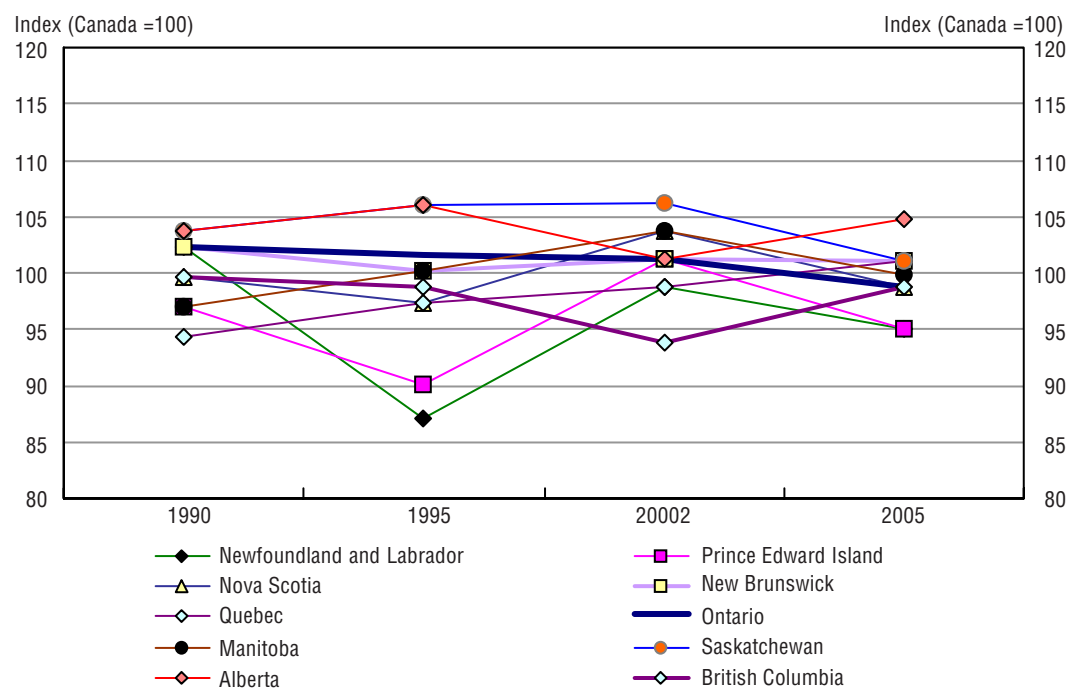
Relative full-time employment rates for college graduates who did not pursue further education, 1995-2005, by province



Source: Special analysis of Statistics Canada's National Graduate Surveys.

Figure 8.6

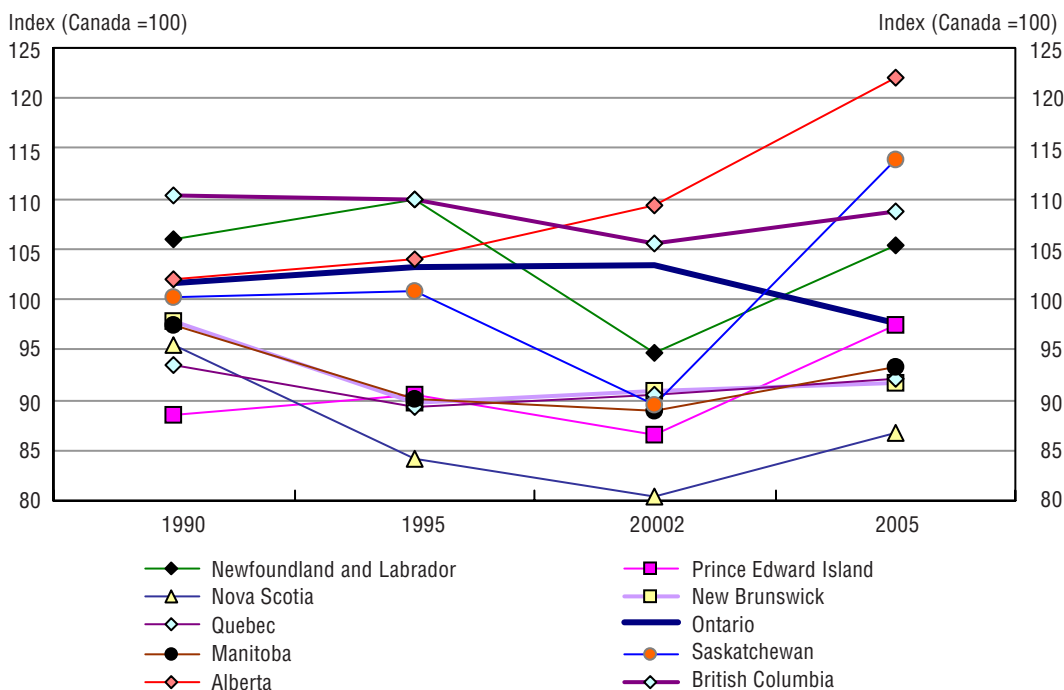
Relative full-time employment rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province



Source: Special analysis of Statistics Canada's National Graduate Surveys.

Figure 8.7

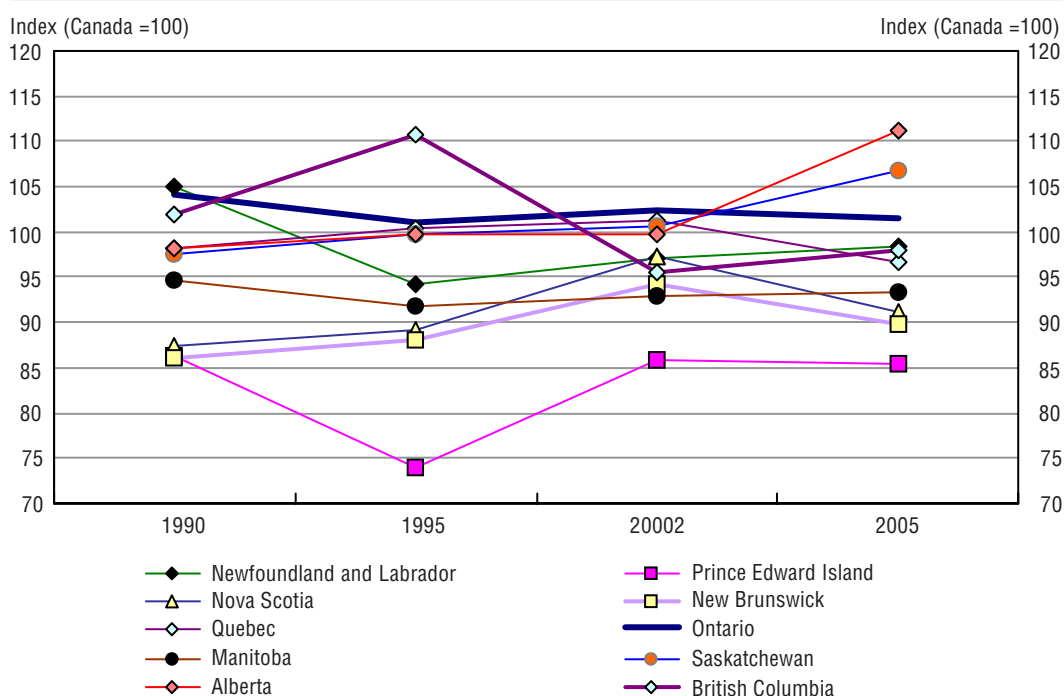
Average wage rates for those having completed a college program who did not pursue further education, by province, 1990-2005



Source: Special analysis of Statistics Canada's National Graduate Surveys.

Figure 8.8

Relative average wage rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province



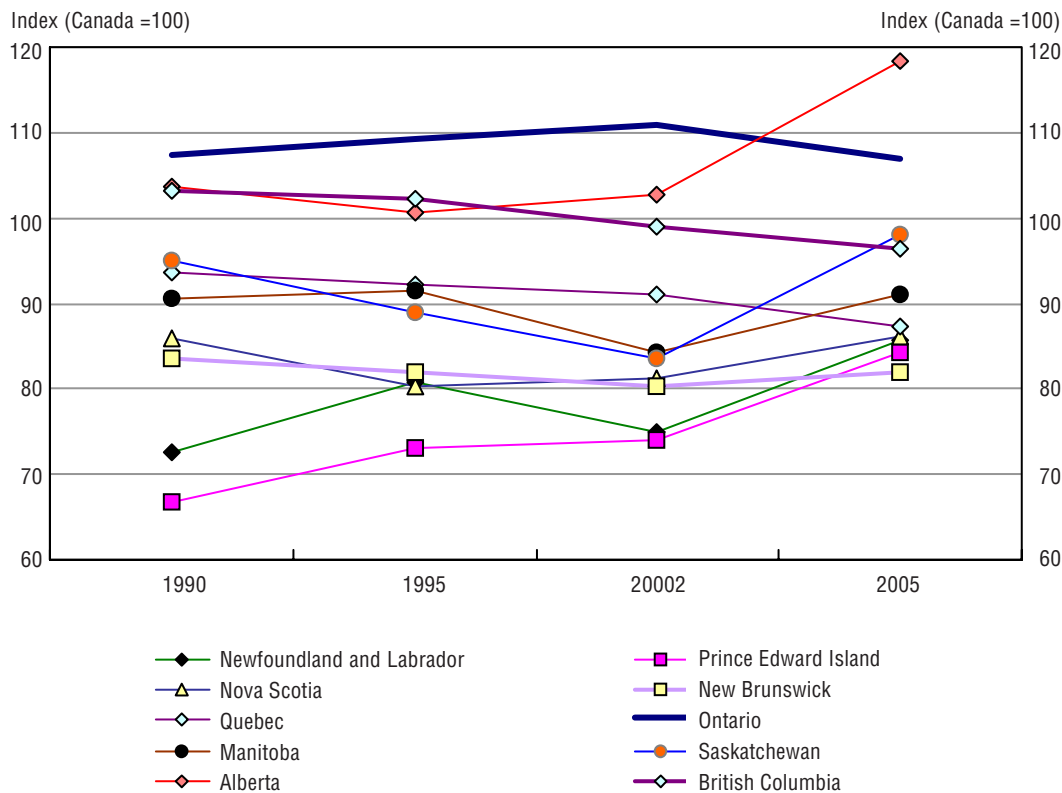
Source: Special analysis of Statistics Canada's National Graduate Surveys.

Collectively the figures reveal a somewhat less pronounced decline in the labour market outcomes of Ontario graduates, a finding that suggests that higher proportions of graduates going on to further studies in the most recent period are drawing down average labour market outcomes. When these students eventually leave post-secondary education they will undoubtedly attract higher salaries.

The following figure plots average earnings for all adults aged 25 to 34 for the same four reference years.

Figure 8.9

Relative average wage rates for those with earnings, aged 25 to 34, 1995-2005, by province



Source: Special analysis of Statistics Canada's National Graduate Survey.

The figure reveals that the apparent decline in labour market outcomes of recent Ontario post-secondary graduates largely reflects a secular decline in labour market outcomes for all Ontario workers. Thus, we conclude that the available data on the relative labour market outcomes of Ontario post-secondary graduates do not support the hypothesis of falling secondary, nor post-secondary quality.

Chapter 9: The future

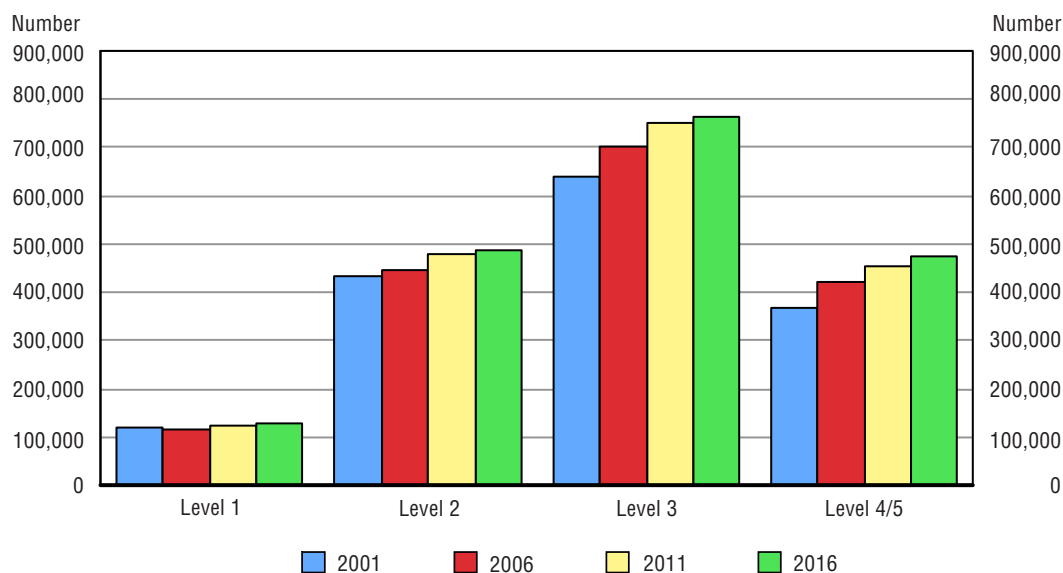
Recently completed research suggests that the demand for literacy skill is projected to grow rapidly over the coming decade (DataAngel, 2010).

The approach employed for these projections combines the relationships between literacy level and individual characteristics observed in Statistics Canada's 2003 Adult Literacy and Life Skills Survey (IALSS) with a set of detailed population projections produced by Statistics Canada that provide the empirical base that underpins most government planning. The tangible result is a set of estimates of the number of adults at each of the five literacy levels identified in the IALSS assessment. These data allow for an analysis of how the distribution of literacy is likely to evolve and what the projected changes imply for policy.

Related research undertaken by the authors suggests that the supply of literacy skill in Ontario is unlikely to grow as rapidly as demand, with the result that current literacy skill shortages are projected to grow in magnitude. Figures 9.1 and 9.2 plot the projected numbers and proportions of future youth cohorts aged 16 to 25 in Ontario that fall below IALSS Level 3.

Figure 9.1

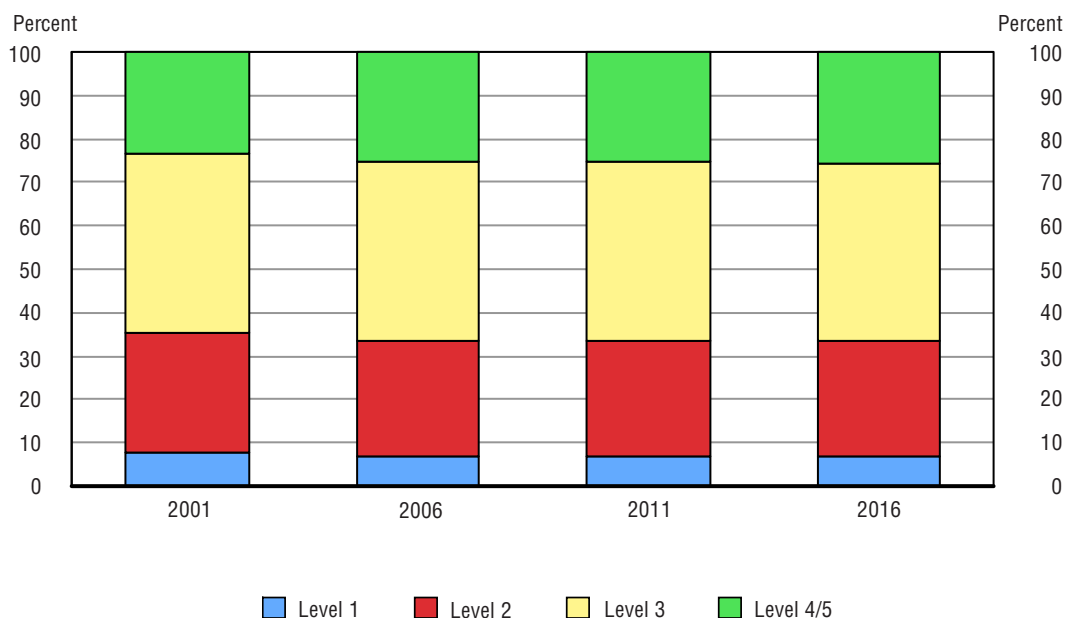
Projected number of adults aged 16 to 25 by prose literacy proficiency level, Ontario, 2001-2016



Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Figure 9.2

Projected proportion of adults aged 16 to 25 by prose literacy proficiency level, Ontario, 2001-2016



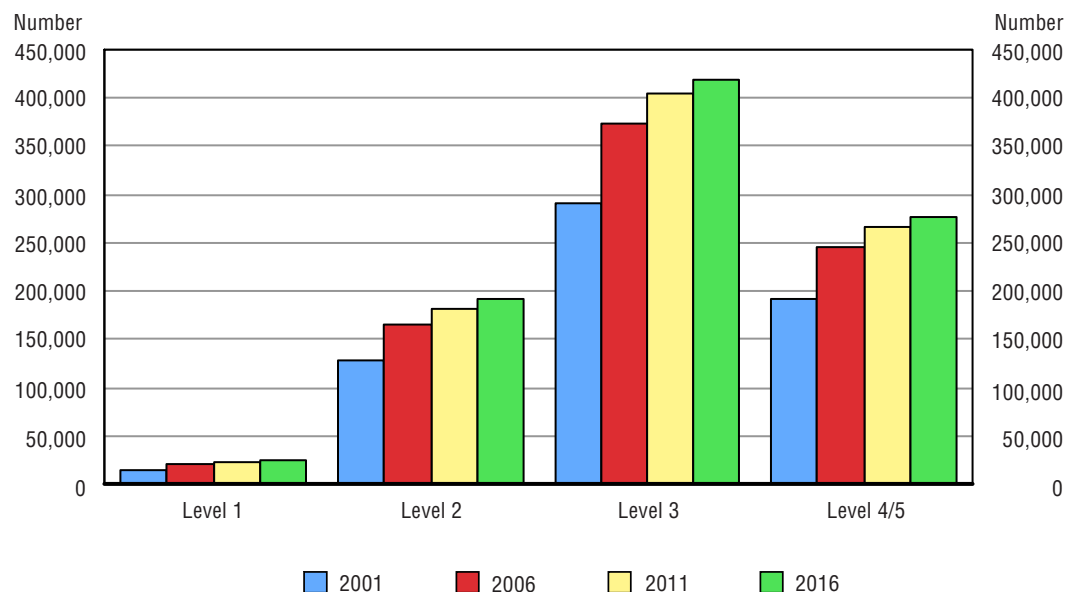
Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

The figures reveal that the absolute number of low skilled Ontario youth is projected to grow over the coming decade leaving the proportion of low skilled Ontario youth relatively stable.

Figures 9.3 and 9.4 extend this analysis by plotting the projected proportions of Ontario college and university graduates in these same cohorts that are likely to have literacy skills below IALSS Level 3.

Figure 9.3

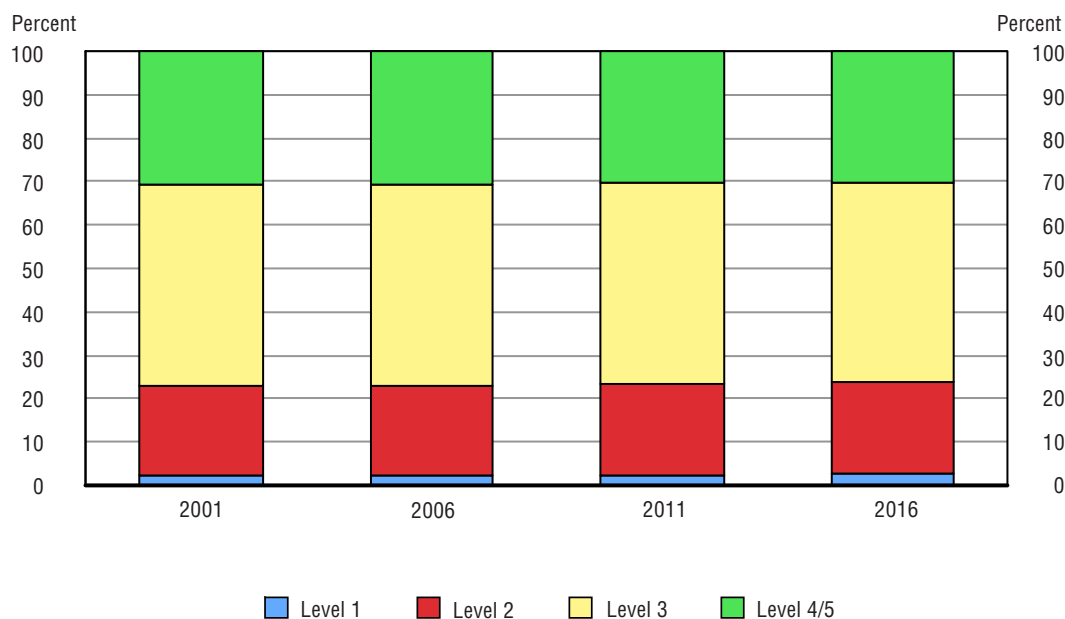
Projected number of adults aged 16 to 25 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016



Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Figure 9.4

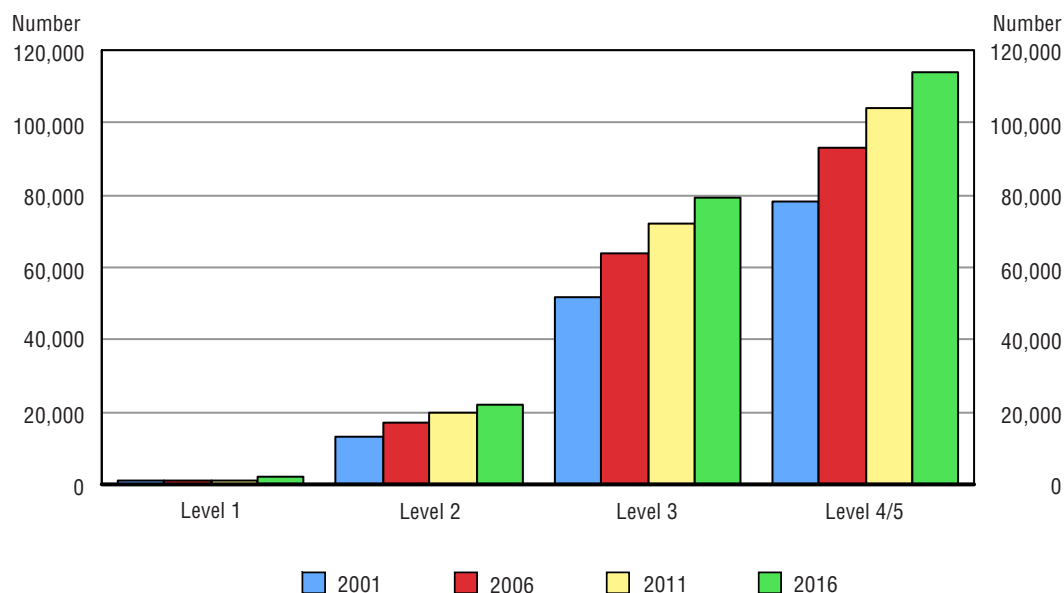
Projected proportion of adults aged 16 to 25 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016



Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Figure 9.5

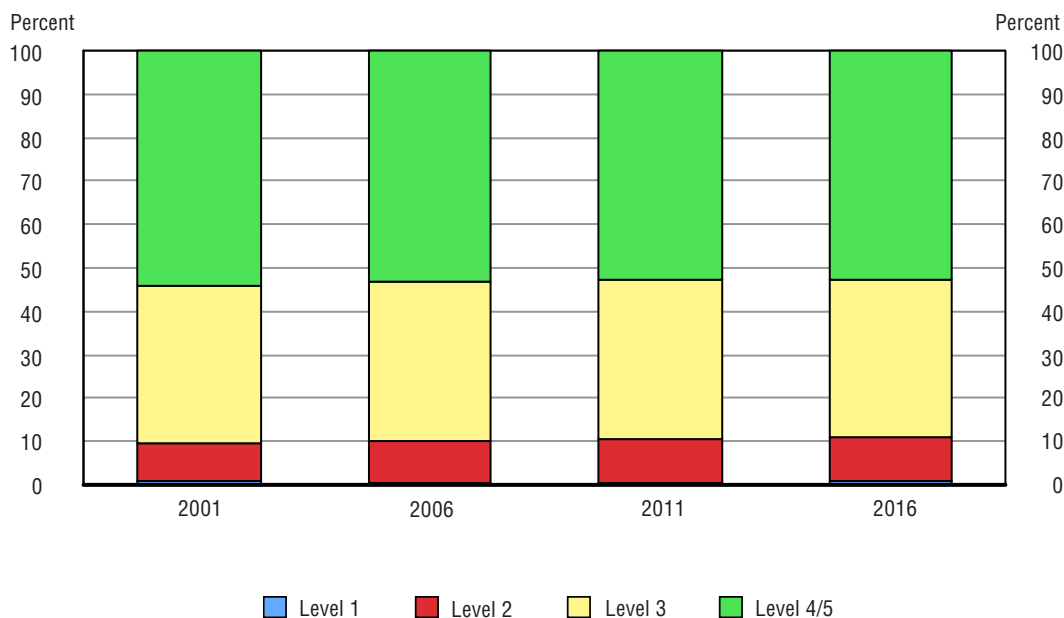
Projected number of adults aged 16 to 25 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016



Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Figure 9.6

Projected proportion of adults aged 16 to 25 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016



Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

The projection suggests that 11% of Ontario university graduates, and a surprising 25% of Ontario youth with non-university post-secondary education, will leave the Ontario post-secondary system with post-secondary qualifications but weak literacy skills. These proportions roughly match the proportions of students with IALSS Level 1 and 2 literacy skills being admitted to post-secondary study in the YITS 2000 cohort. These findings, if realized, suggest that post-secondary graduation does not depend upon having achieved IALSS Level 3 literacy skills. The same findings confirm that Ontario's post-secondary faculty have been exposed to significant numbers of students with Level 1 and 2 literacy skills, enough we think to have a material impact on their perceptions of the relative quality of the secondary education system.

Chapter 10: Summary and conclusion

This volume reports on the results of an analysis that attempted to:

Document what parents think about trends in the quality of Ontario educational output at the secondary level.

Summarize what has been reported in the media with respect to the quality of Ontario educational output at the secondary level.

Explore the degree to which the readily available empirical evidence supports the hypothesis that the quality of Ontario secondary educational output has been falling.

Restricting the analysis to empirical evidence that is readily available carries important implications for interpretation of the study's findings.

To begin with readers should be clear that much of the data that one would need to arrive at an unequivocal answer to this question has either never been collected or has been collected only on an occasional basis.

Moreover, accessing much of the data that does exist would require time and resources that were not available to the research team. For example, the linkage and analysis of administrative data from the post-secondary Application Centres, individual student records held by from post-secondary institutions, and from individual student records held in various parts of the Ministry, would provide a much clear picture of outgoing secondary quality and how it influences participation, persistence in and efficiency of post-secondary education.

The inevitable conclusion is that the current analysis depends upon bringing multiple lines of evidence from multiple data sources to test the hypothesis of falling secondary quality. Provided that the multiple lines of evidence consistently support the hypothesis then one can be reasonably confident in the conclusions reached.

One of the key assumptions that underlies the analysis is that reading literacy – the ability of understand and apply information derived from print – is a reliable proxy for the general skill level of secondary students and, by extension, the relative quality of educational output. Although literacy skill is not a perfect proxy of quality, a large body of research suggests that literacy is the single most important predictor of secondary grades, secondary graduation, post-secondary participation, post-secondary persistence to graduation and, ultimately, of relative labor market success.

Thus, with the caveat that such an approach can only yield indicative rather than definitive results, we believe that conclusions reached are both reasonable and useful.

With the introduction and summary presentation in mind our professional judgment is that:

The public seems to be reasonably happy with the quality of secondary education in Ontario. The available evidence suggests a general level of satisfaction.

Our analysis of the media coverage is that it is not overly critical of the quality of secondary education in Ontario. The coverage reviewed seems to be focused on a limited range of specific concerns for which there appears to be little empirical basis.

In the current context it would be naïve to assume that the opinions of the post-secondary institutions are not influenced to some extent by the fact that they might benefit from additional funding where a case to be made for falling secondary quality. Conversely, post-secondary institutions might be criticized for failing to adjust their program content and teaching methods to changes in the composition of student intake and ironically their own expectations in the face of fundamental changes in how they deliver content. Recent increases in the share of total costs born by students render such criticism particularly important.

There is no empirical evidence that supports the central hypothesis that the quality of Ontario secondary output is falling. In fact, several lines of evidence suggest that the quality of secondary output in Ontario has been rising steadily. This conclusion holds true whether judged by absolute or relative rates of change in average achievement both nationally or internationally. This conclusion also holds when the focus is shifted from trends in average performance to trends in the proportion of students falling below the level of skill believed to be needed to support post-secondary study, labour market success, social participation and life long learning. International consensus suggests that Level 3 on the IALSS prose literacy scale represents the current minimum needed to take full advantage of education at the post-secondary level, to compete in the global knowledge economy, to be active adult learners and to participate socially and democratically.

Despite this generally positive conclusion, the skill level of Ontario secondary leavers remains cause for concern because of the relatively high proportions of students exiting the system with skills below that judged to be needed to support key educational, economic and social objectives. A simple comparison of the proportion of students leaving the Ontario secondary system with these inadequate skill levels – either as graduates or not – to the proportions of students entering Ontario’s post-secondary system suggests this is a serious problem. An estimated 20% of university students and 60% of college students have skills below IALSS level 3. An analysis of how post-secondary access is influenced by skill clearly demonstrates that, in general, the most skilled students are being admitted to the province’s post-secondary institutions. The overwhelming majority of university students admitted to post-secondary programs have the literacy skill levels to support a full return on their own, and the public’s investment. A minority of college students have the requisite skill level to take full advantage of training at this level.

Our analysis of the relative wages of Ontario post-secondary graduates does not provide any indication that the quality of post-secondary output is falling, at least as reflected in the relative wage rates of Ontario post-secondary graduates.

Implications for policy and additional research

The analyses presented in this report provide interesting new insights into the functioning of Ontario's secondary and post-secondary education systems. Viewed from a policy perspective the results raise two key concerns.

First, the fact that over 40% of students are still leaving Ontario's secondary system with skills below that believed to be needed to support the province's social and economic objectives is both a cause for concern and justification for the Ministry to continue to focus its efforts on improving early literacy outcomes.

Second, the fact that significant proportions of post-secondary participants have literacy skills below that believed to be needed to take full advantage of education at the post-secondary level raises questions about admission standards being applied by the province's post-secondary institutions and raises questions about the impact that these practices are having on the rates of return that students and taxpayers are realizing on their investments.

The results also carry implications when viewed from a research perspective. Given the importance of education to maintaining Ontario's competitiveness in the global knowledge economy we believe that an effort to trace students over time as they move through the primary, secondary and post-secondary systems and eventually out into the labour market is warranted. Such a system, already in place in other jurisdictions, would provide a means to address issues of educational quality and equity in a systematic way.

The table below sets out a summary of our empirical research.

Table 10.1

Summary of topic area, research questions, methods, analysis and conclusions

Topic areas	Questions	Methodology	Analysis and conclusions
Socio-cultural context		Socio-cultural gradients.	The children of first generation immigrants living in Ontario exhibit much lower average scores than their non-immigrant and second-generation peers. The children of second-generation immigrants outperform non-immigrants, a result that reflects their parent's higher levels of educational attainment.
	What is the socio-cultural context for understanding quality?		Average scores for all three cohorts display a strong with social background. Children who are from relatively disadvantaged realize significantly lower average scores. Significant proportions of 15 year olds from all three groups score below 529, the level believed to be needed for students to take full advantage of education at the post-secondary level. Perceptions of secondary quality might be coloured were large numbers of these low-skilled students admitted to study at the post-secondary level.
Public perceptions	What is the public perception of the quality of Ontario high school graduates now and in the past?	Media Analysis - summarizing what has been reported.	Most education-related stories are framed more in terms of money (cost) and equality of access rather than the quality of outcomes in providing high school education. The only exception seems to be a great many articles and coverage about the fairness and effectiveness of periodic testing procedures.
	What perception do colleges, universities, employers have of the quality and "readiness" of Ontario high school graduates for post-secondary destinations? Has it changed over the past 40 years?	Analysis of OISE Survey of public attitudes to education.	Overall respondents perceive improved quality at the high school level has increased over the past decade. This needs to be seen in the context where confidence in schools lags behind satisfaction and confidence in educational policy remains low. These data do not support the hypothesized drop in the quality of secondary education in Ontario.

Table 10.1 concluded**Summary of topic area, research questions, methods, analysis and conclusions**

Topic areas	Questions	Methodology	Analysis and conclusions
Secondary school	What do we know about the actual quality of Ontario high school graduates now and in the past? What is the existing evidence?	Provincial Output indicators of human capital based on test scores from the International Adult Literacy Survey.	Ontario's standardized scores have risen from a low in 1951 of roughly 30% below the national mean to approximately 20% above the national mean in 2001. Ontario's rate of improvement is the most rapid among the provinces. These data do not support the hypothesized drop in the quality of secondary education in Ontario
		Analysis by Willms and Murray of 1994 IALS and the 2003 IALSS.	The quality of Ontario secondary leavers has remained unchanged at least over the 9 year period 1994 to 2003. These data do not support the hypothesized drop in the quality of secondary education in Ontario.
			The quality of low skilled youth leaving the Ontario secondary system appears to have been falling. The figure also reveals that Ontario's relative rank in secondary quality has been rising by this standard.
	How does the quality of Ontario high school graduates compare internationally now and in the past?	Data from the OECD PISA assessment of 15 year olds provides a means to compare the quality of the Ontario primary and secondary system to a broad cross- and international peers.	Ontario performs well internationally, realizing average reading literacy scores well above many of Canada's key competitors, including the United States and the UK. Nationally, Ontario achieved the 4 th highest average provincial score. Ontario's relatively high performance leaves more room for a decline in quality but provides no evidence in support of the hypothesized drop in the quality of secondary education in Ontario.
Post-secondary education	What successes are Ontario high school graduates experiencing in post-secondary education now and in the past?	Comparison of estimates of average literacy scores from the 1994 IALS to those of the 2003 IALSS.	The data suggests a slight decline in the average skills of the population aged 16 and over in Ontario, a decline attributable to skill loss after secondary leaving. These data do not support the hypothesized drop in the quality of secondary education in Ontario but do raise questions about what social and economic processes might underlie the observed skill loss.
		National Graduates Survey Relative average wage rates data for those with earnings, aged 25 to 34, 1995-2005.	Ontario post-secondary graduates do not support the hypothesis of falling secondary, nor post-secondary quality.
		Pan-Canadian Education Indicators Program participation rates by college and university.	Ontario post-secondary participation rates are high in both absolute and relative terms and have been growing at a more rapid rate than in other provinces. Higher participation rates open the possibility that Ontario's post-secondary students are less able on average than other provinces and are becoming increasingly so at a more rapid rate than in other jurisdictions. These findings might underlie a perception of falling secondary quality even where no such decline is evident.
		Post-secondary participation rates from the 2000 Youth in Transition Survey cohort.	9.3% of the cohort with skills below 529 attended university and 22.1% attended college, proportions that represent 20% and 60% of enrollment at these levels. These data confirm that post-secondary classes include non-negligible numbers of students with low literacy skills even at the university level. These findings might underlie a perception of falling secondary quality even where no such decline is evident.
The Future		Projections combine the relationships between literacy level and individual characteristics observed in Statistics Canada's 2003 Adult Literacy and Life Skills Survey (ALL) with a set of detailed population projections produced by Statistics Canada.	The projection suggests that 11% of Ontario university graduates, and a surprising 25% of Ontario youth with non-university post-secondary education, will leave the Ontario post-secondary system with post-secondary qualifications but weak literacy skills. These proportions match those observed in the YITS cohort. These findings might underlie a perception of falling secondary quality even where no such decline is evident and suggest that post-secondary participation is failing to improve the literacy skills of some students.

Appendix A: What are socio-cultural gradients and what do they show?

A socio-cultural gradient describes the relationship between a social outcome and socio-economic status for individuals in a specific jurisdiction, such as a school, a province or state, or a country (Willms, 2006). For the purposes of this analysis, the social outcome is students' scores on the PISA reading scale. The term socio-economic status (SES) refers to people's relative position on a social hierarchy, based on their access to, or control over, wealth, prestige and power (Mueller and Parcel, 1981). Standard practice in the educational literature relies on an index of student socio-economic status, derived from a combination of parental education, occupation, home possessions and income, as an indicator of their SES. The analysis presented in this chapter uses an indicator based solely upon the educational attainment of each parent, but the discussion of level, scope and strength of gradient still pertains. This approach was selected because of high levels of non-response to the PISA questions on parental occupation.

The relationship depicted by socio-cultural gradients are summarized by three components: their level, their slope, and the strength of the relationship (Willms, 2006).

The **level of the socio-economic gradient** is defined as the expected score on the outcome measure for a person with a particular level of socio-economic status. In this case, the levels of the gradients reflect the average reading scores at each level of parental education.¹¹

The **slope of a socio-economic gradient** indicates the extent of inequality among sub-populations that are attributable to socio-economic status. In this case, the slope of the gradients indicates the extent to which parental education has influenced the development of skills among 15-year-old students in Ontario. A shallow gradient indicates that there are relatively few inequalities in proficiency among students with differing levels of socio-economic status. A steep slope suggests that students with relatively low levels of parental education tend to be low skilled, and conversely, students who have the benefit of higher levels of parental education tend to be more skilled. Large differences indicate that access to good instruction and engagement in school, interest in learning and the use of skills acquired in school are systematically related to socio-economic differences.

11. The height of the gradient in the middle of the distribution of parental education scores is approximately 525 points.

Figure 4.4 shows that the gradients for performance in Ontario have a relatively steep slope overall, but with a slightly steeper slope at higher levels of parental education. For youth whose parents had at least 12 years of education, average levels of performance are significantly higher.

The strength of a socio-economic gradient refers to the proportion of variance performance that is explained by SES. If the strength of the relationship is strong, then a considerable amount of the variation in the outcome measure is associated with socio-economic status, whereas a weak relationship indicates that relatively little of the variation is associated with socio-economic status.

Figure 4.4 shows that gradient strength in Ontario is relatively strong; that is, there is considerable variation in student performance that is explained by parental education.

The gradient lines represent average scores along the full range of socio-economic background. As such they reveal nothing about the distribution of scores that exists around the average scores at each point along the gradient line. It might be that the average performance might be concealing increases in the proportion of students falling below the skill level needed to take full advantage of education at the post-secondary level and to compete in the emerging global economy. Level 3 on the International Adult Literacy and Skills Survey (IALSS) has been proposed by a number of researchers as the requisite level (Statistics Canada and OECD, 1995; OECD and HRDC, 2000; Statistics Canada and OECD, 2005; Willms, 2006), a value that is equivalent to a score of 529 on the OECD PISA reading literacy scales (see text box)(Yamamoto, 2003).

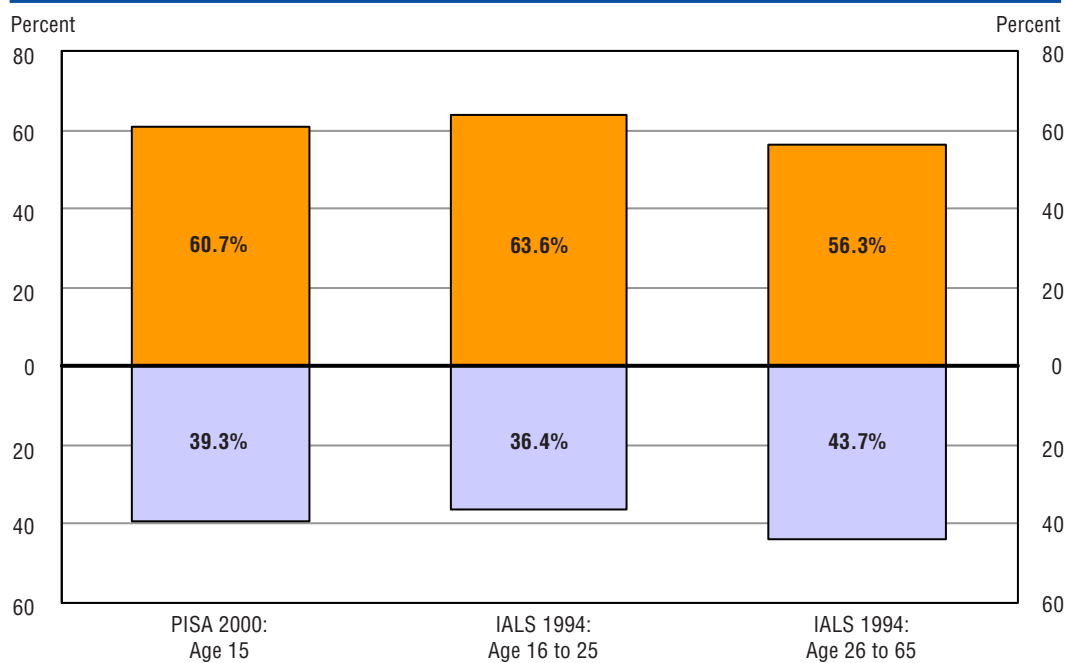
Comparing PISA and IALSS scores

The reading literacy measures carried on the Organization for Economic Cooperation and Development's Programme for International Student Assessment (PISA) and on Statistics Canada's International Adult Literacy and Skill Survey (IALSS) are based on the same theory of reading and employ comparable methods. The literacy proficiency measures themselves, however, apply quite different master standards of mastery to the underlying proficiency data. To be placed at a proficiency level IALSS respondents must display an 80% or greater probability of getting items at that level correct. PISA uses a less demanding standard of 67%. This difference in mastery standards makes it difficult to compare the results of the two studies. Work has been undertaken that allows the results of the two studies to be compared directly. Kirsch and Yamamoto (ETS, 2002) have linked the two proficiency scales using test items that were carried on both assessments. The following chart displays the results of this linkage.

Research has suggested that students need to have achieved Level 2 on the IALSS proficiency scales to compete in the global economy and to take full advantage of education at the post-secondary level (Willms, 2007; CCL and CLLRNET, 2009). On the common PISA/IALSS reading literacy scale this translates into a need to score above 529 on the PISA scale. The following chart reveals that the proportion of 15 year olds that fall below this threshold in the 2000 cycle of PISA (39%) mirrors the proportion of 16 to 25 year olds classified in 1994 IALS (36%) with the slight 3% difference being attributed to skill acquisition associated with labour market experience and post-secondary participation.

Figure A.1

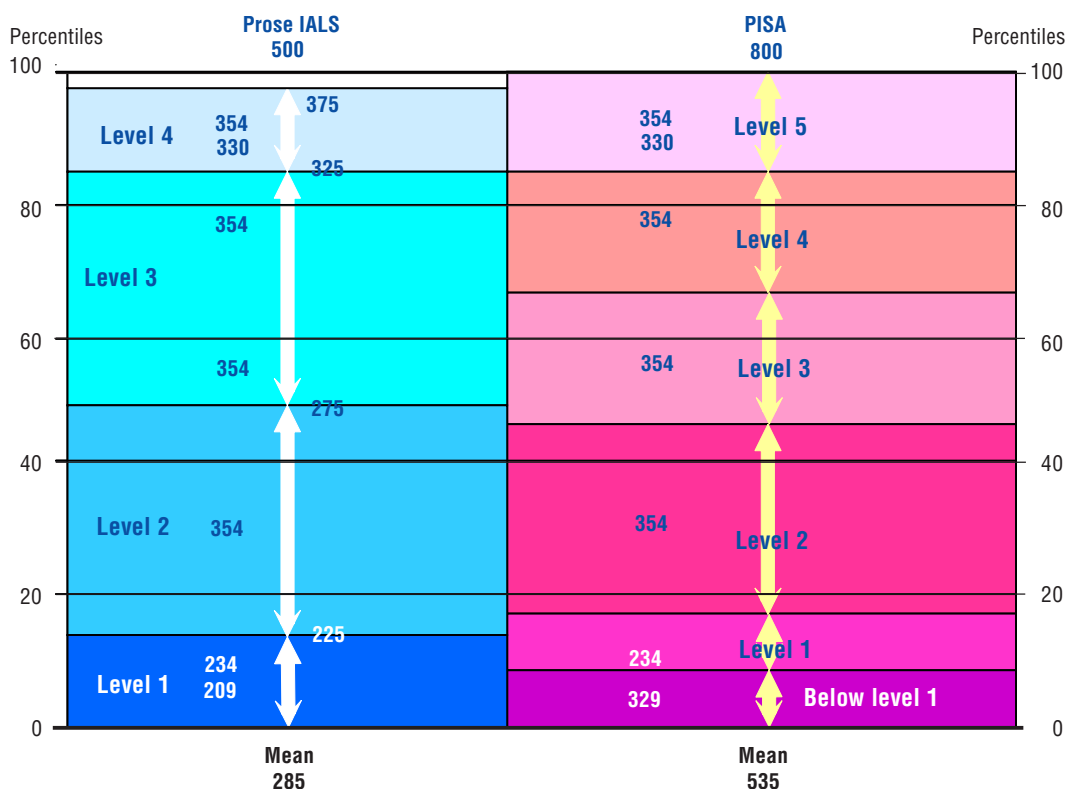
The PISA and IALSS proficiency scales compared: Percentage of the population above and below the level 2 / level 3 boundary



Source: PISA 2000 and IALS 1994.

Figure A.2

A comparison of the PISA and IALS distribution by proficiency level



Source: PISA 2000 and IALS 1994.

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Appendix C: Statistical tables

Table 2.1

Percentage seeing improvement in the quality of education over the past 10 years

	High school	Elementary school
1981	32	..
1985	28	..
1989	27	..
1991	25	29
1993	..	29
1995	23	29
1999	18	25
2003	23	27
2005	28	34
2007	30	34

.. not available for a specific reference period

Table 2.2

Streaming and testing at high school

	Support for streaming at or before grade 10	Support for grade 10 literacy test even if fewer graduate	Support for a lower-level school leaving certificate
	Percent		
1994	51	..	..
1996	37	..	..
1998	37	..	..
2000	44	..	..
2002	..	78	63
2004	48	69	54

.. not available for a specific reference period

Table 4.1**Average reading literacy scores of in-school youth aged 15 in 2000, provinces and countries, 2000**

Country and province	Average	Standard error	Confidence interval (+/-)
Alberta	550	(3.3)	6.5
Finland	546	(2.6)	5.1
British Columbia	538	(2.9)	5.7
Quebec	535	(3.0)	6.0
Canada	534	(1.6)	3.1
Ontario	533	(3.31)	6.5
Manitoba	529	(3.5)	7.0
Saskatchewan	529	(2.7)	5.3
New Zealand	529	(2.8)	5.5
Australia	528	(3.5)	7.0
Ireland	527	(3.2)	6.4
Korea	525	(2.4)	4.8
United Kingdom	523	(2.6)	5.1
Japan	522	(5.2)	10.4
Nova Scotia	521	(2.3)	4.5
Prince Edward Island	517	(2.4)	4.8
Newfoundland and Labrador	517	(2.8)	5.6
Sweden	516	(2.2)	4.4
Austria	507	(2.4)	4.8
Belgium	507	(3.6)	7.1
Iceland	507	(1.5)	2.9
Norway	505	(2.8)	5.6
France	505	(2.7)	6.4
United States	504	(7.0)	14.0
New Brunswick	501	(1.8)	3.5
Denmark	497	(2.4)	4.7
Switzerland	494	(4.2)	6.4
Spain	493	(2.7)	8.4
Czech Republic	492	(2.4)	4.7
Italy	487	(2.9)	5.8
Germany	484	(2.5)	4.9
Liechtenstein	483	(4.1)	8.2
Hungary	480	(4.0)	7.9
Poland	479	(4.5)	8.9
Greece	474	(5.0)	9.9
Portugal	470	(4.5)	9.0
Russian Federation	462	(4.2)	8.3
Latvia	458	(5.3)	10.3
Luxembourg	441	(1.6)	3.2
Mexico	422	(3.3)	6.6
Brazil	396	(3.1)	6.2

Table 4.4**Population sizes, sample sizes and proportions of students scoring below IALS Level 3 by immigrant status, Ontario, 2000, 2003, and 2006**

	2000	2003	2006
Population sizes	Number		
Non-immigrants	88,864	66,973	92,936
Second generation immigrants	20,136	12,462	21,277
First generation immigrants	19,548	18,375	21,562
Missing data on immigrant status	1,827	29,480	1,2723
Total	130,145	127,290	148,499
Sample sizes	Number		
Non-immigrants	3,143	1,871	2,002
Second generation immigrants	556	280	372
First generation immigrants	536	407	353
Missing data on immigrant status	55	811	324
Total	4,290	3,369	3,051

Percentage below 529 Cut-Point in Reading (the level believed to be needed for students to take full advantage of education at the post-secondary level)

	2000		2003		2006	
	Percent	Standard errors	Percent	Standard errors	Percent	Standard errors
Non-immigrants	43.8	(1.7)	42.3	(2.2)	42.0	(2.5)
Second generation immigrants	46.4	(2.2)	40.3	(4.6)	40.7	(4.0)
First generation immigrants	51.2	(3.5)	52.6	(3.6)	51.8	(3.9)
All students	45.8	(1.4)	47.7	(1.8)	44.6	(2.4)
All students with immigrant data	45.4	(1.4)	44.0	(1.9)	43.3	(2.4)

Source: Special analyses undertaken by Doug Willms, KSI Research International.

Table 4.6**Expected scores of an Ontario student who was of average an SES (SES=0 scaled on 2000 value), literacy, mathematics and science, 2000, 2003, and 2006**

	Expected Scores of a child who was of average SES (SES = 0 scaled on 2000 value)				
	Reading			Math	Science
	2000	2003	2006	2006	2006
	Average score			Average score	
Non-immigrants	530.4	539.0	538.4	527.6	544.0
Second generation immigrants	503.9	510.7	511.1	512.8	510.9
First generation immigrants	528.0	541.0	543.7	522.0	535.5

Source: Special analyses undertaken by Doug Willms, KSI Research International.

Table 5.2

Average literacy scores across selected regions and provinces, population aged 16 and over 1994 and 2003

	IALS		IALSS		Difference IALS - IALSS
	Mean	Standard error	Mean	Standard error	
A. Prose					
Atlantic region	264	(2.5)	269	(1.1)	5
New Brunswick	260	(3.9)	264	(2.1)	4
Quebec	255	(5.0)	266	(1.2)	11 *
Ontario	275	(6.7)	270	(1.4)	-5
Western region	280	(4.9)	281	(0.9)	1
Alberta	289	(4.6)	283	(1.9)	-6
British Columbia	275	(8.8)	281	(1.2)	6
Canada	270	(3.7)	272	(0.7)	2
B. Document					
Atlantic region	259	(2.3)	267	(1.2)	8 *
New Brunswick	256	(3.4)	261	(2.4)	5
Quebec	254	(7.1)	263	(1.4)	8
Ontario	277	(6.3)	270	(1.3)	-7
Western region	277	(5.6)	281	(0.8)	4
Alberta	284	(5.5)	283	(1.8)	-1
British Columbia	274	(8.9)	282	(1.4)	
Canada	270	(3.6)	271	(0.6)	2

* p<.05 statistically significant.

Notes: The northern territories are excluded from the Canadian average.

The Western region includes Manitoba, Saskatchewan, Alberta and British Columbia.

The Atlantic region includes Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island.

Source: International Adult Literacy Survey, 1994; International Adult Literacy and Skills Survey, 2003.

Table 5.3

Changes in the distribution of literacy levels across selected regions and provinces, population aged 16 and over, 1994 and 2003

	1994 IALS							
	Level 1		Level 2		Level 3		Level 4/5	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
A. Prose								
Atlantic region	24.1	(1.8)	28.4	(3.2)	31.5	(4.1)	16.1	(2.6)
New Brunswick	26.9	(3.1)	31.3	(2.5)	26.0	(3.0)	15.8	(3.0)
Quebec	27.0	(3.5)	27.1	(4.1)	37.3	(3.0)	8.6	(2.1)
Ontario	19.9	(3.8)	24.5	(3.6)	30.9	(3.4)	24.7	(3.1)
Western region	17.9	(2.5)	22.9	(2.9)	35.5	(4.3)	23.7	(4.2)
Alberta	14.1	(2.7)	21.0	(2.6)	38.0	(2.6)	26.9	(3.2)
British Columbia	19.6	(7.5)	23.9	(5.9)	35.7	(7.6)	20.8	(5.0)
Canada	21.5	(1.7)	25.0	(1.7)	33.9	(2.3)	19.6	(2.2)
B. Document								
Atlantic region	28.0	(1.7)	26.4	(1.8)	30.7	(3.6)	14.9	(2.1)
New Brunswick	28.9	(2.0)	28.5	(3.3)	27.8	(4.1)	14.8	(2.2)
Quebec	29.7	(3.7)	27.0	(5.0)	29.3	(4.5)	14.0	(3.3)
Ontario	20.5	(4.4)	21.3	(2.1)	29.3	(4.2)	28.8	(3.5)
Western region	19.2	(1.6)	23.9	(1.9)	32.4	(2.6)	24.5	(2.9)
Alberta	16.3	(3.0)	19.8	(4.7)	37.9	(6.5)	26.0	(3.5)
British Columbia	19.5	(2.6)	27.5	(2.2)	29.3	(4.7)	23.7	(4.5)
Canada	23.1	(2.1)	23.9	(1.4)	30.3	(1.7)	22.6	(1.5)
2003 IALSS								
	Level 1		Level 2		Level 3		Level 4/5	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
A. Prose								
Atlantic region	20.7	(0.9)	30.2	(1.2)	34.7	(1.0)	14.4	(0.8)
New Brunswick	22.7	(1.6)	33.3	(2.2)	31.6	(2.2)	12.4	(2.0)
Quebec	22.3	(1.2)	32.3	(1.4)	32.8	(1.1)	12.6	(0.8)
Ontario	21.3	(0.9)	26.7	(1.4)	35.0	(1.8)	17.0	(1.7)
Western region	15.8	(0.6)	24.8	(1.2)	38.1	(1.1)	21.3	(0.9)
Alberta	13.6	(1.1)	25.9	(2.0)	39.6	(2.2)	21.0	(1.6)
British Columbia	17.3	(0.8)	22.7	(1.7)	37.2	(2.1)	22.9	(1.7)
Canada	19.9	(0.5)	27.8	(0.7)	35.4	(0.8)	17.0	(0.7)
B. Document								
Atlantic region	23.4	(0.9)	29.9	(1.0)	32.1	(1.2)	14.7	(0.9)
New Brunswick	26.1	(1.7)	32.2	(2.0)	29.8	(2.9)	11.9	(2.3)
Quebec	25.1	(1.0)	31.5	(1.0)	30.4	(1.0)	12.9	(0.7)
Ontario	22.7	(0.8)	25.8	(1.6)	33.5	(2.1)	18.1	(1.4)
Western region	16.5	(0.6)	24.6	(0.8)	36.5	(1.1)	22.5	(0.8)
Alberta	14.8	(1.2)	25.4	(1.4)	37.2	(1.9)	22.6	(1.5)
British Columbia	17.4	(1.1)	22.9	(1.6)	35.3	(1.6)	24.4	(1.3)
Canada	21.5	(0.4)	27.1	(0.6)	33.5	(0.9)	17.9	(0.5)

Notes: The Western region includes Manitoba, Saskatchewan, Alberta and British Columbia.

The Atlantic region includes Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island.

The northern territories are excluded from the Canadian average.

Regions and provinces are ranked in descending order according to the percentage above Level 2 in 1994.

Source: International Adult Literacy Survey, 1994; International Adult Literacy and Skills Survey, 2003.

Table 5.7**College enrollment rates all ages by province; 1992/1993 and 2005/2006**

College enrollment rates all ages														
	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006
Percent														
Newfoundland and Labrador	52	56	67	64	63	68	71	83	45	65	80	75	63	79
Prince Edward Island	44	63	56	61	65	77	89	89	57	64	72	68	49	61
Nova Scotia	22	21	20	46	47	50	47	50	42	61	46	42	42	44
New Brunswick	26	27	30	31	40	42	43	44	39	49	46	45	55	72
Quebec	158	154	154	151	146	142	141	142	154	147	143	132	129	126
Ontario	74	77	79	81	83	82	81	82	72	71	75	87	86	91
Manitoba	32	32	31	28	33	36	38	43	43	43	43	43	42	43
Saskatchewan	27	30	26	22	19	22	18	20	27	25	23	23	22	55
Alberta	111	106	105	100	102	103	109	100	93	91	93	89	102	101
British Columbia	133	132	127	125	124	131	131	131	150	157	156	146	143	122
Canada	100	100	100	100	100	100	100	100	100	100	100	100	100	100

College enrollment rates all ages														
	1992/1 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006
Percent														
Newfoundland and Labrador	1	1	1	1	1	1	1	2	1	1	2	2	1	2
Prince Edward Island	1	1	1	1	1	2	2	2	1	1	2	2	1	1
Nova Scotia	0	0	0	1	1	1	1	1	1	1	1	1	1	1
New Brunswick	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Quebec	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Ontario	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Manitoba	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Saskatchewan	1	1	1	0	0	0	0	0	1	1	1	1	1	1
Alberta	2	2	2	2	2	2	2	2	2	2	2	2	2	2
British Columbia	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Canada	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Table 5.9**Absolute rates of post-secondary participation at the university level by province, 1992-2007**

	University enrollment rates 15 to 24															
	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008
	Percent															
Newfoundland and Labrador	14	13	14	13	13	13	13	14	14	15	15	16	16	17	17	17
Prince Edward Island	13	13	12	11	10	11	11	12	12	12	13	14	15	14	15	15
Nova Scotia	18	19	19	18	19	19	18	19	20	21	22	24	23	23	23	22
New Brunswick	15	16	16	16	15	15	15	15	16	17	17	18	18	18	17	17
Quebec	10	10	10	10	10	10	10	11	11	11	12	13	13	13	13	13
Ontario	13	13	13	13	12	12	12	12	12	13	14	16	16	17	18	18
Manitoba	16	16	15	14	14	13	13	13	13	14	15	17	17	18	18	18
Saskatchewan	14	14	14	14	14	14	14	14	15	16	17	17	16	11	11	11
Alberta	10	10	10	10	10	10	10	10	10	11	11	11	12	12	12	12
British Columbia	7	7	7	8	8	8	8	8	8	9	9	9	10	11	11	11
Canada	12	12	12	11	11	11	11	11	12	12	13	14	14	15	15	15

Table 5.10**Relative rates of post-secondary participation at the university level by province, 1992-2007****Table 5.11****Rates of post-secondary participation at the university level and college level combined by province, 1992-2007****Table 5.13****Relative university enrollment rates by province, youth aged 15 to 24 by province, 1992/1993 and 2007/2008**

	University enrollment rates 15 to 24 by province; 1992/1993 and 2007/2008															
	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008
	Percent															
Newfoundland and Labrador	113	112	117	112	114	116	118	123	124	120	116	113	113	115	110	108
Prince Edward Island	110	107	101	96	90	94	94	102	106	100	100	102	104	97	100	98
Nova Scotia	153	156	159	159	165	165	163	162	169	172	171	171	160	156	151	146
New Brunswick	127	130	135	137	134	133	130	128	136	138	130	126	121	121	113	110
Quebec	86	87	89	89	90	90	90	93	92	92	92	90	89	89	87	88
Ontario	113	113	112	110	108	107	107	107	106	105	107	111	113	114	116	117
Manitoba	136	132	130	124	121	117	116	114	115	119	116	119	119	119	119	116
Saskatchewan	119	117	116	119	122	122	122	124	128	128	131	123	114	71	71	69
Alberta	85	85	82	88	89	88	88	90	87	87	85	82	82	80	80	80
British Columbia	62	61	63	66	69	72	74	70	71	72	69	66	67	75	75	75

Table 5.14

Relative university enrollment rates by province, youth aged 25 to 34 by province, 1992/1993 and 2007/2008

University enrollment rates 25 to 34 by province; 1992/1993 and 2007/2008																
	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008
	Percent															
Newfoundland and Labrador	75	72	72	76	81	82	84	84	85	85	86	89	91	91	92	92
Prince Edward Island	57	56	47	46	48	57	61	61	71	63	64	64	66	63	69	62
Nova Scotia	108	109	108	106	111	114	116	115	122	124	122	124	122	119	116	116
New Brunswick	73	74	75	76	76	71	73	69	74	71	71	71	71	71	71	73
Quebec	140	142	144	140	141	141	141	142	142	143	145	148	149	149	150	151
Ontario	92	90	92	91	88	87	85	85	86	86	86	84	82	82	83	83
Manitoba	100	103	102	99	99	98	98	97	104	109	104	108	110	107	108	109
Saskatchewan	119	115	118	120	123	124	125	123	125	122	123	121	115	70	71	70
Alberta	81	84	69	85	91	95	97	106	96	94	93	90	90	89	88	85
British Columbia	59	61	64	64	66	68	69	65	64	65	64	63	67	79	78	78

Table 6.1**The likelihood of completing high school by age 21 by reading proficiency levels at age 15, Ontario 2006**

Odds ratio relative to reference group	Odds-ratios of completing high school by age 21 by reading proficiency levels at age 15
	Reading literacy level used as reference group in logistic model
Level 1 and below	...
Level 2	1.58
Level 3	2.52 *
Level 4	3.25 *
Level 5	4.04 *

... Not applicable.

* Significant at $P \leq .05$.

Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

Table 6.2**The likelihood of post-secondary participation by age 21 by reading proficiency levels at age 15, Ontario, 2006**

Odds ratio relative to reference group	Odds-ratios of postsecondary participation by age 21 by reading proficiency levels at age 15
	Reading literacy level used as reference group in logistic model reference group level 1 or below
Level 1 and below	...
Level 2	3.02
Level 3	8.03 *
Level 4	19.59 *
Level 5	50.93 *

... Not applicable.

* Significant at $P \leq .05$.

Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

Table 6.3**The relative likelihood of post-secondary participation by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006**

Province	Relative likelihood
	Percent
Newfoundland	4.14
Nova Scotia	4.41
Prince Edward Island	3.64
New Brunswick	3.88
Quebec	6.15
Ontario	4.12
Manitoba	3.42
Saskatchewan	3.88
Alberta	2.91
British Columbia	3.82

Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

Table 6.4
The relative likelihood of post-secondary participation at the university level by age 21 for youth with literacy skills above 529 at age 15, Canada by province, 2006

Province	Relative likelihood
	Percent
Newfoundland	4.69
Nova Scotia	5.08
Prince Edward Island	4.34
New Brunswick	4.42
Quebec	3.49
Ontario	5.85
Manitoba	3.24
Saskatchewan	3.77
Alberta	5.22
British Columbia	3.44

Source: Special analyses of the Youth in Transition Survey, 2000 cohort.

Table 7.1**University student / faculty ratio by province, 2000/2001 and 2005/2006**

	1996/1997	2000/2001	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
Full-time faculty	Number						
Newfoundland and Labrador	858	861	839	846	849	864	876
Prince Edward Island	186	192	204	210	210	222	213
Nova Scotia	1,905	1,962	2,007	2,115	2,166	2,160	2,202
New Brunswick	1,125	1,149	1,182	1,203	1,212	1,212	1,209
Quebec	8,706	8,022	8,467	8,649	8,970	9,186	9,315
Ontario	12,216	12,663	13,181	13,737	14,298	14,676	15,213
Manitoba	1,551	1,539	1,623	1,644	1,671	1,680	1,707
Saskatchewan	1,341	1,443	1,501	1,518	1,512	1,524	1,506
Alberta	2,760	3,255	3,522	3,567	3,729	3,792	3,891
British Columbia	3,312	3,273	3,527	3,717	3,954	4,296	4,434
Canada	33,963	34,359	36,053	37,203	38,574	39,615	40,566
Enrolment	1996/1997	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
	Number						
Newfoundland and Labrador	16,056	16,137	16,275	16,902	17,550	18,042	18,336
Prince Edward Island	2,736	3,369	3,354	3,561	3,855	3,969	3,786
Nova Scotia	36,843	38,820	40,569	41,898	44,772	43,539	43,308
New Brunswick	23,631	23,643	24,309	24,648	25,557	24,900	25,017
Quebec	235,692	233,652	240,672	250,809	260,067	263,400	265,992
Ontario	306,828	320,112	335,718	362,736	397,773	413,406	431,055
Manitoba	32,052	31,938	34,146	35,172	38,049	39,288	39,621
Saskatchewan	31,317	31,473	32,094	34,254	34,560	33,132	20,622
Alberta	70,038	76,344	79,125	83,454	86,100	89,055	91,557
British Columbia	74,583	75,126	80,391	82,959	85,437	90,753	108,225
Canada	829,770	850,620	886,656	936,390	993,714	1,019,478	1,047,504

Source: Statistics Canada and CMEC, PCEIP.

Table 8.1**Full-time employment rate by province for those having completed a college program in 1990-2005**

	Employed full time by province; For those having completed a College program in 1990-2005			
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	100	107	91	104
Prince Edward Island	105	97	108	105
Nova Scotia	92	94	99	105
New Brunswick	114	104	105	108
Quebec	96	96	101	100
Ontario	101	101	101	96
Manitoba	105	106	103	109
Saskatchewan	93	107	103	113
Alberta	101	110	105	110
British Columbia	103	90	91	100

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.2**Full-time employment rate by province for those having completed a Bachelor's program in 1990-2005**

	Employed full time by Province; for those having completed a Bachelor's program in 1990-2005 as a percentage of the national average at each period			
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	101	87	97	98
Prince Edward Island	95	91	104	97
Nova Scotia	100	97	102	99
New Brunswick	102	103	106	99
Quebec	95	97	99	101
Ontario	101	100	100	97
Manitoba	97	103	104	102
Saskatchewan	105	108	107	108
Alberta	104	108	107	109
British Columbia	104	99	92	101

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.3**Relative average wage rates for college graduates, 1995-2005, by province**

Average Wage by Province; for those having completed a College program in 1990-2005 as a percentage of the national average at each period				
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	105	111	95	107
Prince Edward Island	89	90	88	101
Nova Scotia	95	84	81	90
New Brunswick	98	90	93	95
Quebec	94	89	89	90
Ontario	102	104	104	96
Manitoba	97	92	90	96
Saskatchewan	101	102	91	117
Alberta	101	103	110	124
British Columbia	110	108	105	114

Table 8.4**Relative average wage rates for Bachelor's graduates, 1995-2005, by province**

Bachelor's Average Wage				
	1990	1995	2000	2005
	Dollars			
Newfoundland and Labrador	33,400	27,600	36,200	42,700
Prince Edward Island	26,700	22,700	31,000	36,000
Nova Scotia	26,800	27,100	34,300	39,300
New Brunswick	26,900	27,000	34,900	39,100
Quebec	30,900	30,600	37,600	41,200
Ontario	33,400	30,100	38,100	43,300
Manitoba	29,300	28,200	34,100	39,100
Saskatchewan	30,100	30,700	37,600	45,700
Alberta	30,800	30,700	38,100	48,900
British Columbia	32,100	33,500	36,600	43,000
Yukon	...	...	x	51,200
Northwest Territories	...	...	x	x

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*.

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.5

Relative full-time employment rates for college graduates who did not pursue further education, 1995-2005, by province

	College Employed full time, who did not pursue further education			
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	76	75	73	79
Prince Edward Island	79	70	85	83
Nova Scotia	71	66	80	79
New Brunswick	87	74	84	82
Quebec	73	67	85	80
Ontario	78	72	81	77
Manitoba	80	73	82	83
Saskatchewan	71	75	81	86
Alberta	77	78	84	84
British Columbia	79	65	75	80
Yukon	61	74	85	89
Northwest Territories	82	76	73	67
Canada	76	71	81	79

	College Number of graduates			
	1990	1995	2000	2005
	Number			
Newfoundland and Labrador	700	700	1,400	600
Prince Edward Island	500	400	800	600
Nova Scotia	600	1,400	2,800	2,600
New Brunswick	700	1,200	2,200	2,300
Quebec	14,800	15,200	10,200	15,000
Ontario	20,600	33,300	38,800	30,700
Manitoba	1,300	2,300	1,900	2,400
Saskatchewan	1,200	1,300	2,100	1,900
Alberta	6,200	8,200	4,200	7,200
British Columbia	5,500	8,000	10,400	8,200
Yukon	...	100	100	100
Northwest Territories	100	100	100	100

... not applicable

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.6

Relative full-time employment rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province

	Bachelor's Employed full time, who did not pursue further education			
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	76	60	80	79
Prince Edward Island	72	62	82	79
Nova Scotia	74	67	84	82
New Brunswick	76	69	82	84
Quebec	70	67	80	84
Ontario	76	70	82	82
Manitoba	72	69	84	83
Saskatchewan	77	73	86	84
Alberta	77	73	82	87
British Columbia	74	68	76	82
Yukon	...	...	x	100
Northwest Territories	...	...	x	x
Canada	74	69	81	83
	Bachelor's Number of graduates			
	1990	1995	2000	2005
	Number			
Newfoundland and Labrador	1,800	1,500	1,100	1,600
Prince Edward Island	300	400	300	300
Nova Scotia	4,300	4,500	3,100	3,800
New Brunswick	2,300	2,800	2,000	2,300
Quebec	21,600	35,000	19,200	22,200
Ontario	37,100	38,400	29,700	36,300
Manitoba	4,100	4,300	2,900	3,600
Saskatchewan	4,000	4,000	3,100	3,100
Alberta	7,400	8,200	7,500	10,000
British Columbia	7,300	8,700	9,900	11,500
Yukon	...	...	x	-
Northwest Territories	...	...	x	x

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*.

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.7

Average wage rates for those having completed a college program who did not pursue further education, by province, 1990-2005

	College Average Wage, who did not pursue further education			
	1990	1995	2000	2005
	Dollars			
Newfoundland and Labrador	27,300	27,800	30,100	38,200
Prince Edward Island	22,800	22,900	27,500	35,300
Nova Scotia	24,600	21,300	25,600	31,400
New Brunswick	25,200	22,700	28,900	33,200
Quebec	24,100	22,600	28,800	33,400
Ontario	26,200	26,100	32,900	35,400
Manitoba	25,100	22,800	28,300	33,800
Saskatchewan	25,800	25,500	28,500	41,300
Alberta	26,300	26,300	34,800	44,200
British Columbia	28,400	27,800	33,600	39,400
Yukon	26,300	32,500	35,200	42,900
Northwest Territories	38,100	36,100	46,500	44,300
Canada	25,761	25,305	31,803	36,235

	College Number of graduates			
	1990	1995	2000	2005
	Number			
Newfoundland and Labrador	700	700	1,400	600
Prince Edward Island	500	400	800	600
Nova Scotia	600	1,400	2,800	2,600
New Brunswick	700	1,200	2,200	2,300
Quebec	14,800	15,200	10,200	15,000
Ontario	20,600	33,300	38,800	30,700
Manitoba	1,300	2,300	1,900	2,400
Saskatchewan	1,200	1,300	2,100	1,900
Alberta	6,200	8,200	4,200	7,200
British Columbia	5,500	8,000	10,400	8,200
Yukon	...	100	100	100
Northwest Territories	100	100	100	100

... not applicable

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.8

Relative average wage rates for Bachelor's graduates who did not pursue further education, 1995-2005, by province

	Bachelor's Average wage, who did not pursue further education			
	1990	1995	2000	2005
	Dollars			
Newfoundland and Labrador	33,100	29,000	38,500	45,500
Prince Edward Island	27,200	22,800	34,100	39,400
Nova Scotia	27,500	27,500	38,600	42,100
New Brunswick	27,100	27,100	37,400	41,500
Quebec	30,900	30,900	40,200	44,600
Ontario	32,800	31,100	40,600	46,900
Manitoba	29,800	28,300	36,900	43,100
Saskatchewan	30,700	30,700	39,900	49,300
Alberta	30,900	30,700	39,600	51,300
British Columbia	32,100	34,100	37,900	45,200
Yukon	...	...	x	51,200
Northwest Territories	...	...	x	x
Canada	31,492	30,806	39,690	46,182
	Bachelor's Number of graduates			
	1990	1995	2000	2005
	Number			
Newfoundland and Labrador	1,800	1,500	1,100	1,600
Prince Edward Island	300	400	300	300
Nova Scotia	4,300	4,500	3,100	3,800
New Brunswick	2,300	2,800	2,000	2,300
Quebec	21,600	35,000	19,200	22,200
Ontario	37,100	38,400	29,700	36,300
Manitoba	4,100	4,300	2,900	3,600
Saskatchewan	4,000	4,000	3,100	3,100
Alberta	7,400	8,200	7,500	10,000
British Columbia	7,300	8,700	9,900	11,500
Yukon	...	...	x	-
Northwest Territories	...	...	x	x

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*.

Source: Special analysis of Statistics Canada's National Graduate Surveys.

Table 8.9

**Relative average wage rates for those with earnings, aged 25 to 34,
1995-2005, by province**

	Average earnings for those with earnings (aged 25 to 34) by province; 1990-2005 as a percentage of the national average at each period			
	1990	1995	2000	2005
	Percent			
Newfoundland and Labrador	73	81	75	86
Prince Edward Island	67	73	74	84
Nova Scotia	86	80	81	86
New Brunswick	83	82	80	82
Quebec	94	92	91	87
Ontario	107	109	111	107
Manitoba	91	92	84	91
Saskatchewan	95	89	84	98
Alberta	104	101	103	118
British Columbia	103	102	99	96

Table 9.1**Projected number of adults aged 16 to 25 by prose literacy proficiency level, Ontario, 2001-2010**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Number				
2001	1,558,000	119,000	433,000	641,000	366,000
2006	1,686,000	116,000	447,000	701,000	422,000
2011	1,809,000	125,000	478,000	750,000	456,000
2016	1,854,000	130,000	487,000	762,000	475,000
2021	1,807,000	134,000	485,000	732,000	456,000
2026	1,816,000	139,000	497,000	731,000	449,000
2031	1,903,000	146,000	521,000	766,000	471,000

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Table 9.2**Projected proportion of adults aged 16 to 25 by prose literacy proficiency level, Ontario, 2001-2016**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Percent				
2001	100	8	28	41	23
2006	100	7	27	42	25
2011	100	7	26	41	25
2016	100	7	26	41	26
2021	100	7	27	41	25
2026	100	8	27	40	25
2031	100	8	27	40	25

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Table 9.3**Projected number of adults aged 16 to 25 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Number				
2001	627,000	15,000	128,000	292,000	193,000
2006	807,000	20,000	166,000	374,000	246,000
2011	873,000	22,000	181,000	404,000	266,000
2016	913,000	24,000	193,000	420,000	277,000
2021	878,000	25,000	194,000	399,000	261,000
2026	868,000	25,000	195,000	392,000	256,000
2031	905,000	26,000	203,000	409,000	267,000

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Table 9.4**Projected proportion of adults aged 16 to 25 with some post-secondary education by prose literacy proficiency level, Ontario, 2001-2016**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Percent				
2001	100	2	20	47	31
2006	100	2	21	46	30
2011	100	3	21	46	30
2016	100	3	21	46	30
2021	100	3	22	45	30
2026	100	3	22	45	29
2031	100	3	22	45	30

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Table 9.5**Projected number of adults aged 16 to 25 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Number				
2001	143,000	1,000	13,000	52,000	78,000
2006	175,000	1,000	17,000	64,000	93,000
2011	197,000	1,000	20,000	72,000	104,000
2016	216,000	2,000	22,000	79,000	114,000
2021	220,000	2,000	23,000	81,000	114,000
2026	214,000	2,000	24,000	79,000	110,000
2031	226,000	2,000	25,000	83,000	116,000

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Table 9.6**Projected proportion of adults aged 16 to 25 who are university graduates by prose literacy proficiency level, Ontario, 2001-2016**

	Total	Level 1	Level 2	Level 3	Level 4/5
	Percent				
2001	100	1	9	36	55
2006	100	1	10	37	53
2011	100	1	10	37	53
2016	100	1	10	37	53
2021	100	1	10	37	52
2026	100	1	11	37	51
2031	100	1	11	37	51

Source: Analysis undertaken for the Canadian Council on Learning by DataAngel Policy Research.

Appendix D: Acknowledgements

The analyses presented in this report were undertaken by T. Scott Murray, Victor Glickman, David Scott, Richard Shillington and Doug Willms. All errors and omissions are those of these authors. Special thanks are due to Linda Schachter for her editorial advice and to Danielle Baum for her typesetting skill. The authors would like to thank Tamara Knighton and Klarka Zeman at Statistics Canada for their help in accessing Statistics Canada's data. Finally, the authors owe a debt of thanks to Carmen Maggisano, Kim Sobara and Yolande Martin for their insightful comments and suggestions.