



1

# Introduction: The Case for Linking PISA with Longitudinal Studies

Abstract.....	18
Introduction .....	18
Measuring the educational, labour market and social outcomes in relation to competencies acquired early in life .....	18
A rationale for a longitudinal extension of PISA.....	20
Conclusion .....	21
Organisation of this report.....	22



## Abstract

The Programme for International Student Assessment (PISA) offers a comprehensive, high-quality and reliable indicator of how education systems fare in close to 70 countries. It allows countries to benchmark their performance against international standards and also contextualise their performance in order to inform policy in a number of areas. Using Canada as an example, this chapter shows that the results of cross-sectional studies such as PISA can be significantly enhanced through the strategic implementation of a longitudinal component. These enhancements can lead to significant policy insights in understanding the choices made at different ages and the impact these choices have on consequent education and labour market outcomes. With these insights at hand, decision makers can make more informed investments in public policy.

## INTRODUCTION

In most OECD countries, education is one of the highest social expenditures as a proportion of GDP. A better understanding of the process by which citizens build their human capital is important for successful government policies for growth and development. Therefore, it is vital to have reliable measures of the returns to investments in education as well as the impact of competencies learned during education on later outcomes in life.

## MEASURING THE EDUCATIONAL, LABOUR MARKET AND SOCIAL OUTCOMES IN RELATION TO COMPETENCIES ACQUIRED EARLY IN LIFE

In addition to governments, parents, students and those who teach and run education systems seek reliable information on how well their education systems prepare students for life. As a start, many countries assess national student performance in schools. For example, among 36 countries with comparable data, including the 30 members of the OECD, 22 countries undertake national student examinations and/or assessments and 17 require schools to be evaluated (either self-evaluations and/or inspections by an external body) at regular intervals.

The need for international comparability has gained prominence over recent years, since in an increasingly interconnected world, the quality of education can no longer solely be judged by improvements in national standards, but also by benchmarking national performance against the most successful education systems in the world. Comparative international assessments can, therefore, extend and enrich the national picture by providing a larger context within which to interpret national performance. Such international comparisons enable countries to identify areas of relative strengths and weaknesses and to monitor the pace of progress in their own education system. They can also stimulate countries to raise aspirations by showing what is possible in terms of the quality, equity and efficiency of education achieved in other countries. From such comparisons they can better understand how other governments and different education systems address similar policy challenges.

In response to the need for cross-nationally comparable evidence on student performance, the OECD launched the Programme for International Student Assessment (PISA) in 1997. PISA represents a commitment by governments to monitor the outcomes of education systems in terms of student achievement on a regular basis and within an internationally agreed common framework. PISA breaks new ground as the framework focuses on what 15-year-olds (regardless of grade or curriculum) know and examines the real-world application of knowledge gained in school in an international perspective. It aims to provide a new basis for international



and national policy dialogue about the skills that are relevant to adult life and how best to develop them through compulsory education for all children.

Because PISA only assesses 15-year-olds in school, these data alone cannot answer fundamental policy questions such as: how successfully do education systems ensure high levels of performance among students to prepare them for adult life? Do all children completing school have equal odds of achieving such high levels of performance regardless of geographic location, socio-economic condition or cultural background? Are children equally well-prepared to carry out adult roles? What factors lead to positive longer-term educational and labour-market outcomes over the lifespan?

In 2001, OECD countries, assisted by Statistics Canada, discussed a potential strategy to integrate PISA more systematically with a series of longitudinal surveys in order to link the competencies students acquire as young adults with their subsequent educational, labour-market and social outcomes. The essence of longitudinal methodology is that the same individuals are surveyed on a regular basis over time. By surveying the same students (whose competencies were measured by PISA) repeatedly over time, it is possible to monitor how early performance affects later outcomes in life within the context of the choices they make and their major life events. Longitudinal data linked to measured performance provide a key means of relating the extent to which the variation in knowledge and competence acquired through school do in fact affect the distribution of education, labour market and social outcomes in adult life.

Canada was the first country to pioneer such an approach by a coherent set of data enhancements in order to understand the links between student performance and adult outcomes. In 2000, Canada augmented the sample size of children who participated in PISA, so that more detailed national analyses could be conducted. These 30 000 students, whose competencies were measured by PISA in 2000 were interviewed every two years from age 15 into their mid-20s through the longitudinal Youth in Transition Survey (YITS). It is this combination of enhancements that has given Canada the unique advantage of long-run longitudinal analyses of the pathways of a cohort of children who made choices between the ages of 17 and 24 on their time spent on education, work or combinations of both. In addition, parents of these students were also interviewed to gather information on incomes, occupations, countries of origin and aspirations for their children. Furthermore, these data allowed the testing of the predictive value of PISA assessments in relation to concrete outcomes of higher education and the labour market. Specifically, this strategy provided policy relevant evidence to:

- compare Canadian student performance to other countries participating in PISA and to examine the life chances of high and low performers;
- monitor participation in higher education by different groups of young people and factors affecting the choice of discipline and type of higher education;
- track the diversity of traditional and emerging pathways and their impact on higher education as well labour market pathways;
- map the patterns of pathways from initial education to subsequent education and training and the labour market in relation to early competencies;
- identify the factors that influence access to different education and labour market options and whether these pathways were completed, interrupted or unachieved;
- quantify the economic and social benefits from participation in different forms of education and training, such as the labour market destinations of different education and training pathways; and
- investigate additional aspects of the transition from education to adult life, such as family formation and civic participation.



While the longitudinal Youth in Transition Survey will continue until those 15-year-olds in 2000 are 25 years old, results from the analyses of the first waves of data already reveal important insights on the impact of PISA performance on the subsequent educational and labour market options and outcomes.

Other PISA participating countries judge these Canadian results so relevant for their national policies that the decision was made to jointly publish a thematic report of these analyses with the Government of Canada. Moreover, since Canada first began its longitudinal extension of PISA in 2000, a number of other countries, most notably Australia, Denmark, Switzerland and Uruguay, have developed similar approaches, further underlining the relevance of longitudinal data (see Annex A).

Before turning to the analysis of the results in the subsequent chapters, this chapter lays out the rationale for a longitudinal extension of PISA in greater detail.

## **A RATIONALE FOR THE LONGITUDINAL EXTENSION OF PISA**

The rationale for linking PISA with a longitudinal survey is based on the value of measured competence as a predictor of future outcomes, the importance of the young adulthood phase, the evolving nature of transition between school and work and the importance of reliable antecedents as well as competence as determinants of future educational labour market outcomes. Longitudinal tracking of a cross-sectional cohort also presents advantages of data quality, analytical strengths and reduction of bias.

Longitudinal surveys have traditionally been used to measure progression, but variations in progression could not be explained without some measure of competencies. The combination of performance measures with subsequent pathways is invaluable for evidence-based policy. Cognitive ability, as measured by marks or standardised achievement tests, have been linked to future educational attainment and to labour market earnings. Longitudinal surveys of youth are therefore greatly enhanced by the addition of achievement measures, such as the ones provided by PISA. Without the inclusion of achievement measures, analyses of young people's educational and labour market outcomes do not provide adequate evidence for targeted policies.

The PISA cohort age of 15 makes for a natural beginning for the study of transitions from school to adulthood. Though a great majority of youth at this age are still in secondary school, they are beginning to form expectations about the directions in which they can develop their talents in the future. This is an age at which they start making key decisions that will affect their longer term educational and labour market success. They begin to explore options and gain experience for the labour market through part time or voluntary work. The attitudes towards learning and their learning habits will serve them for the rest of their lives. Therefore, a longitudinal extension of PISA enables the exploration of the relationship between achievements at age 15 and later education and labour market outcomes in order to strengthen the knowledge base for better collaboration between education and labour-market policy in support of smoother school-work transitions. More specifically, it can facilitate the understanding of the longer-term effects of educational achievements at age 15; the formation of educational and occupational aspirations; the effect of schools on educational and occupation outcomes; the impact of various activities on transitions, such as volunteer work, part-time work, participation in work experience programs; the various work-based (apprenticeship), general, vocational, technical and academic pathways taken by youth and the progression to further education and/or the labour market and subsequent transitions.

Most labour market surveys and national transition surveys cover only transitions from the point when people leave education and enter the labour market. However, the transition from education to work can no longer be thought of as a single event. It is now more appropriately seen as a sequence of transitions between single and/or multiple options combining learning and working. By examining the whole transition process,



with a representative cohort of young people born in a particular year, it is possible to understand the different choices made during the transition process in response to complex social and economic contexts. Indeed, the ability to measure change or growth over time is a key benefit of longitudinal analysis.

Furthermore, unlike cross-sectional data, longitudinal studies are better able to isolate confounding factors such as social and cultural background. Each longitudinal record contains information about the past social and educational background of the young person as well as their occupational or educational status over time. The capacity to adjust for background factors while measuring growth or change over time is a key feature of longitudinal data. This is because background data are gathered at an earlier time rather than at the same time as when the educational or employment outcomes are measured. Through the linkage of individual records of policy sensitive variables over time from the same group of individuals, a longitudinal survey permits the study of relationships between factors measured in one period, such as achievement, aspirations, behaviours and outcomes measured in future time periods. The quality of antecedent data also tends to be better in longitudinal rather than cross-sectional data. Respondents in a cross-sectional survey would be required to answer questions based on the past, resulting in potential inaccuracies. Because respondents in longitudinal surveys are interviewed frequently, data quality is better and without recall bias. Statistical methods for removing bias are more powerful when accurate background, educational and work history data are available.

Ideally, a longitudinal design provides an opportunity for respondents to be re-assessed many years later to determine the extent to which the performance at age 15 is related to the learning gained formally and informally since that time. Again, Canada will be the first country to test this innovative methodology, though the results are not available for this publication.

## CONCLUSION

The integration of PISA with longitudinal surveys in order to link the competencies students acquire as young adults with their subsequent educational, labour market and social outcomes offers significant new policy insights. By surveying the students that participated in PISA repeatedly over time, it is possible to monitor how early performance affects their later outcomes in life within the context of the choices they make and their major life events.

At the present time only a minority of OECD countries have some form of national longitudinal study. Those studies have developed at different times with different frameworks, and have only very limited international comparability. Better co-ordination of such studies among countries participating in PISA would, for the first time, allow cross-national analyses of young people's pathways through education and into work in national and international contexts. The diversity of pathways and associated results would provide invaluable information for the targeting of policies and the evaluation of their effectiveness.

The sharing of developmental costs and opportunities for mutual learning that will result from such co-ordination would benefit, in particular:

- countries without a national longitudinal study;
- countries where the current longitudinal study does not include data on student achievement;
- countries whose current longitudinal study does include student achievement data, but where the achievement and other measures are not internationally comparable; and
- countries with a longitudinal study that does not cover a full cross-section of young people, or that covers a limited range of transitions.



Because the group of participating countries in PISA has now grown close to 70, the value of sharing both the experience of building PISA into a national data system as well as the results from longitudinal analysis is magnified. This report, which builds on selected research projects using Canadian data, adds value precisely in this sense. It serves the two-fold objective of demonstrating how the value of PISA can be enhanced for national policy analyses in participating countries and of sharing the results of analyses that might be sensitively generalised to other countries.

## ORGANISATION OF THIS REPORT

This chapter illustrates the relation of competencies acquired early in life by a representative sample of Canadian youth born in 1984, to later educational, social and labour market outcomes.

**Chapter 2** provides an overview of PISA 2000 and describes how YITS was implemented and gives an overview of the Canadian education system in order to provide a context to interpret the results in subsequent chapters.

**Chapter 3** revisits Canadian performance in PISA 2000 and considers how the Canadian education system measures up in terms of quality and equity.

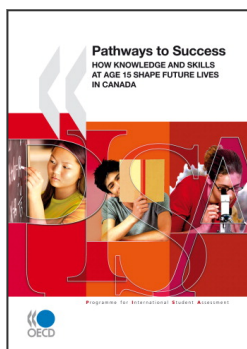
**Chapter 4** considers five major pathways through education and work taken by young Canadians up to age 21, identifies the more and less common pathways and considers the extent to which achievement on PISA varies depending on the pathway selected. The predictive power of achievement on the PISA assessment will be over-estimated if adjustments are not made for background characteristics that are themselves associated with achievement. Therefore, the results in Chapters 5, 6 and 7 examine outcomes and pathways in a more nuanced manner that takes this into account.

**Chapter 5** focuses on educational attainment – that is, how far students had progressed in their educational pathways by age 21. It examines the extent to which attainment varies according to achievement in PISA 2000 as well as a variety of school and student characteristics.

**Chapter 6** addresses three important outcomes relating to post-secondary education; that is, access, persistence and course choice. It seeks to examine the extent to which achievement on PISA, as well as school-based achievement measures, predict these three outcomes. Results are adjusted, once again, for a variety of background characteristics.

**Chapter 7** considers the extent to which achievement on PISA predicts the labour market outcomes of young Canadians at age 21. The influence of other background characteristics is taken into account, including, importantly, the highest level of education attained.

**Chapter 8** – the conclusion – summarises the evidence from the longitudinal analysis for policy and presents transferable ideas for future linkages between PISA and longitudinal studies.



From:

## Pathways to Success

How Knowledge and Skills at Age 15 Shape Future Lives in Canada

Access the complete publication at:

<https://doi.org/10.1787/9789264081925-en>

### Please cite this chapter as:

OECD (2010), "Introduction: The Case for Linking PISA with Longitudinal Studies", in *Pathways to Success: How Knowledge and Skills at Age 15 Shape Future Lives in Canada*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264081925-2-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).