PIAAC: Detailed Q&A

1 What is PIAAC?

The Programme for the International Assessment of Adult Competencies (PIAAC) is an initiative of the Organization for Economic Co-operation and Development (OECD). It is a highly detailed survey that provides internationally comparable measures of three information-processing skills of youth and adults between the ages of 16 and 65, in 24 countries and sub-national regions. In addition to surveying the entire country, Canada collected data for every province and territory.

The skills surveyed are literacy, numeracy, and problem solving in technology-rich environments (PS-TRE). These are considered to be "foundational" skills, in that they form the basis for mastering other, high-level skills that are necessary to functioning at home, school, work and in the community.

PIAAC is also called the *Survey of Adult Skills* by the OECD.

2 What information does PIAAC provide and how was this information collected?

PIAAC collects information from adults aged 16 to 65 and is made up of three main parts: a direct skills assessment, a background questionnaire and a module on the use of skills.

The direct skills assessment examines individual proficiencies in three information-processing skills: literacy, numeracy and problem solving in technology-rich environments (PS-TRE). Each skill is measured along a continuum that has been divided into different levels of proficiency to help interpret the results.

The background questionnaire gathers information such as respondents' demographics, educational attainment and participation, status in the labour market and job characteristics. This information puts the results of the skills assessment into context and allows a better understanding of how skills are distributed across Canada based on population and job characteristics.

The module on the use of skills collects information from each respondent on how they use a range of skills at work and in everyday life, for example practice and use of literacy and numeracy at work and at home.

3   Who conducted the PIAAC study?

PIAAC was conducted by Statistics Canada from November 2011 to June 2012. Over 27,000 respondents across the country completed the survey by computer assisted home based interviews. Respondents were selected in order to obtain a representative sample of people living in each province and territory. In addition, Aboriginal peoples, recent immigrants (i.e. immigrants who had been in Canada for 10 years or less), and official-language minority populations were oversampled in order to provide detailed information about these groups.

4   When will the results from PIAAC be released?

The International and pan-Canadian reports will be released on October 8, 2013. The pan-Canadian report will situate Canada's results in an international context and include analysis specific to Canada such as provincial benchmarking, distribution of skills by socio-demographic characteristics, education and labour force status, and skills of sub-groups of the population (e.g. immigrants and Aboriginal populations).

A series of thematic reports and brief brochures will be created from the Canadian data. Thematic reports will be released through 2014 and 2015, and will explore such topics as: skills in the Canadian labour market; skills, education and adult learning; skills of official language minority communities; skills of immigrants; skills of Aboriginal people; and skills for everyday life.

5   Who funded PIAAC?

In Canada, PIAAC was funded by the following partners: Employment and Social Development Canada, the Council of Ministers of Education, Canada (on behalf of the provinces and territories); Canadian Northern Economic Development Agency; Citizenship and Immigration Canada; Aboriginal Affairs and Northern Development Canada; and Public Health Agency of Canada.

At the international level, PIAAC was funded by each of the 24 participating countries and sub-national regions.

6.   Why did Canada invest in PIAAC?

There have been many social, political, and economic changes throughout the world during the last three decades; one of them being the revolution in computer technology that increasingly shapes experiences of the classroom, the workplace, and even everyday life. The Canadian labour market has also changed significantly in terms of its most active industries, the types of work available to Canadians, and the increasing use of technology by workers in almost every occupation.

People need to adapt to change, and they can do it more easily if they have the right basic skills. In this context, skills are one of the most important issues in Canada and have been prioritized by the federal government for many years. For example, the federal government renewed its commitment to matching Canadians with jobs by highlighting skills training as its highest priority in the Economic Action Plan 2013.

PIAAC provides current information about the level and distribution of skills of Canadians for understanding what skills people have and how those skills are being used. The latest information on Canadians skills was a decade old, dating from 2003. This new information belongs to all Canadians and will be useful for governments to guide decisions on education and labour market initiatives, and to employers who want information on the pool of potential employees. PIAAC also provides international benchmarking with 23 other countries allowing Canada to situate its performance in a global economy.

7   What countries participated in PIAAC?

Internationally, 24 countries and sub-national regions participated in the first round of PIAAC (2008-2013): Australia; Austria; Canada; Cyprus, Czech Republic; Denmark; England/N. Ireland (UK); Estonia; Finland; Flanders (Belgium); France; Germany; Ireland; Italy; Japan; Korea; Netherlands; Norway; Poland; Russian Federation; Slovak Republic; Spain; Sweden; and United States.

Chile, Greece, Indonesia, Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey are participating in the second round (2012-2016) of PIAAC. A third round of data collection is expected to begin in 2014. Countries participating in this round have not yet been confirmed.

8   Why is Canada's sample size the largest among all OECD participating countries?

Canada is a diverse country made up of two official languages; a significant Aboriginal population; 13 provinces and territories; and a large immigrant population. A large sample size is necessary for having a good understanding of the level and distribution of skills, not only for the overall Canadian population, but also for sub-groups of the population and within each jurisdiction. For instance, with education policy developed and decided at the provincial and territorial level, a larger sample was required to obtain statistically reliable results within each jurisdiction.

In addition, to better understand skill levels of Aboriginal peoples, recent immigrants and official-language minorities, Canada oversampled these populations to ensure reliable estimates.

The smaller sample sizes used by many countries only provide an understanding of skills at the national level.

9   What is literacy? What can people do at specific literacy level?

Literacy in PIAAC is defined as *understanding, evaluation, using, and engaging with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential.* This definition highlights the range of cognitive processes involved in literacy: it stresses that literacy extends well beyond the skills of decoding or comprehending texts, to using them appropriately in context. The abilities to write and understand or reproduce spoken language were not evaluated.

People's literacy is assessed in PIAAC in both print-based and digital texts. In addition to being displayed on screens, digital texts include a range of features that are not found in print, such as menus, scroll bars, and hypertext links. Texts in both formats can be continuous (e.g., sentences that provide descriptions or instructions); non-continuous (e.g., words contained in forms or organized around graphic features like diagrams and maps); mixed (e.g., a newspaper article that combines the two); or multiple (e.g., a blog post that contains an initial text followed by a string of comments).

Literacy proficiency is assessed along a continuum on a scale from 0 to 500 based on respondents' abilities to complete literacy-related tasks. Simpler tasks

may ask respondents to locate specific pieces of information within a text while more complex tasks require inferential reasoning or rhetorical strategies. Proficiency levels are used to help interpret the findings. OECD has divided reporting scales for literacy into five proficiency levels (with an additional category, "below Level 1"), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms.

If a respondent scores at a particular proficiency level, it does not mean they can't complete tasks in the levels above. It only means that —even if they do complete some tasks at a higher level successfully — the probability of consistently doing so is low.

The tasks at each level for the literacy skills are described below:

Below Level 1: Individuals in this category can read brief texts on familiar topics and locate a single piece of specific information identical in form to information in the question or directive. They are not required to understand the structure of sentences or paragraphs and only basic vocabulary knowledge is required. Tasks below Level 1 do not make use of any features specific to digital texts.

Level 1: At this level, individuals can read relatively short digital or print continuous, non-continuous, or mixed texts to locate a single piece of information, which is identical to or synonymous with the information given in the question or directive. These texts contain little competing information. Adults performing at this level can complete simple forms, understand basic vocabulary, determine the meaning of sentences, and read continuous texts with a degree of fluency.

Level 2: At this level, individuals can integrate two or more pieces of information based on criteria, compare and contrast or reason about information and make low-level inferences. They can navigate within digital texts to access and identify information from various parts of a document.

Level 3: At this level, individuals can understand and respond appropriately to dense or lengthy texts, including continuous, non-continuous, mixed, or multiple pages. They understand text structures and rhetorical devices and can identify, interpret, or evaluate one or more pieces of information and make appropriate inferences. They can also perform multi-step operations and select relevant data from competing information in order to identify and formulate responses.

Level 4: At this level, individuals can perform multiple-step operations to integrate, interpret, or synthesise information from complex or lengthy

continuous, non-continuous, mixed, or multiple-type texts that involve conditional and/or competing information. They can make complex inferences and appropriately apply background knowledge as well as interpret or evaluate subtle truth claims or arguments.

Level 5: At this level, individuals can perform tasks that involve searching for and integrating information across multiple, dense texts; constructing syntheses of similar and contrasting ideas or points of view, or evaluating evidence and arguments. They can apply and evaluate logical and conceptual models, and evaluate the reliability of evidentiary sources and select key information. They are aware of subtle, rhetorical cues and are able to make high-level inferences or use specialized background knowledge.

10 What is numeracy? What can people do at specific numeracy level?

Numeracy in PIAAC is defined as *the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life.* This definition highlights the importance of numeracy to a wide range of skills and knowledge used in everyday life (e.g. understanding purchases and receipts, or reading maps) that extend beyond quantity and numbers to include things like dimensions, shapes, proportions, relationships and statistics.

Numeracy proficiency is assessed along a continuum using a scale from 0 to 500 based on respondents' abilities to complete numeracy-related tasks. Simpler tasks may involve identifying some mathematical information by using simple arithmetic skills while more complex tasks involve analysing a problem and evaluating the quality of the solution. Proficiency levels are used to help interpret the findings. OECD has divided reporting scales for numeracy into five proficiency levels (with an additional category, "below Level 1"), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms.

If a respondent scores at a particular proficiency level, it does not mean they can't complete tasks in the levels above. It only means that —even if they do complete some tasks at a higher level successfully — the probability of consistently doing so is low.

The tasks at each level for the numeracy skills are described below:

Below Level 1: Individuals in this category can only cope with very simple tasks set in concrete, familiar contexts where the mathematical content is explicit and that require only simple processes such as counting; sorting; performing basic arithmetic operations with whole numbers or money, or recognising common spatial representations.

Level 1: At this level, individuals can complete tasks involving basic mathematical processes in common, concrete contexts where the mathematical content is explicit with little text and minimal distractors. They can perform one-step or simple processes involving counting, sorting, basic arithmetic operations, understanding simple percents, and locating and identifying elements of simple or common graphical or spatial representations.

Level 2: At this level, individuals can successfully perform tasks that require identifying and acting upon mathematical information and ideas embedded in a range of common contexts where the mathematical content is fairly explicit or visual with relatively few distractors. The tasks may require applying two or more steps or processes involving, for example, calculations with whole numbers and common decimals, percents and fractions; simple measurement and spatial representations; estimation; or interpreting relatively simple data and statistics in texts, tables and graphs.

Level 3: At this level, individuals can successfully complete tasks that require an understanding of mathematical information that may be less explicit, embedded in contexts that are not always familiar, and represented in more complex ways. They can perform tasks requiring several steps and that may involve a choice of problem-solving strategies and relevant processes. They have a good sense of number and space; can recognise and work with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and can interpret and perform basic analyses of data and statistics in texts, tables and graphs.

Level 4: At this level, individuals understand a broad range of mathematical information that may be complex, abstract or embedded in unfamiliar contexts. They can perform tasks involving multiple steps and select appropriate problem-solving strategies and processes. They can analyse and engage in more complex reasoning about quantities and data, statistics and chance, spatial relationships, change, proportions and formulae. They can also understand arguments and communicate well-reasoned explanations for answers or choices.

Level 5: At this level, individuals can understand complex representations, and abstract and formal mathematical and statistical ideas, sometimes embedded in

complex texts. They can integrate several types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and justify, evaluate and critically reflect upon solutions or choices.

11   What is problem solving in technology-rich environments (PS-TRE)? What can people do at specific PS-TRE level?

PS-TRE in PIAAC is defined as *using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks.* It represents the intersection of what are sometimes described as "computer literacy" skills (i.e., the capacity to use computer-based tools and applications) and the cognitive skills required to solve problems.

PS-TRE is assessed along a continuum using a scale from 0 to 500 based on respondents' abilities to solve problems using technology. Simpler tasks involve finding solutions in a small number of steps (e.g. sending an invitation by email) while more advanced problems require multiple steps, goal-setting, making inferences, navigating, and using functions within an application. Proficiency levels are used to help interpret the findings. OECD has divided reporting scales for PS-TRE into three proficiency levels (with an additional category, "below Level 1"), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms.

If a respondent scores at a particular proficiency level, it does not mean they can't complete tasks in the levels above. It only means that —even if they do complete some tasks at a higher level successfully — the probability of consistently doing so is low.

Respondents who had no computer experience, did not pass the ICT core test (typing, highlighting text, scrolling, using a mouse, and drag-and-drop), or chose to opt out of the computer-based assessment were not evaluated on PS-TRE.

The tasks at each level for the PS-TRE skills are described below:

Below Level 1: Individuals in this category can complete tasks in which the goal is explicitly stated and for which the necessary operations are performed in a single and familiar environment. They can solve problems whose solutions involve a relatively small number of steps, the use of a restricted range of operators, and a limited amount of monitoring across a large number of actions.

Level 1: At this level, individuals can complete tasks in which the goal is explicitly stated and for which the necessary operations are performed in a single and familiar environment. They can solve problems in the context of technology-rich environments whose solutions involve a relatively small number of steps, the use of a restricted range of operators, and a limited amount of monitoring across a large number of actions.

Level 2: At this level, individuals can complete problems that have explicit criteria for success, a small number of applications, and several steps and operators. They can monitor progress towards a solution and handle unexpected outcomes or impasses.

Level 3: At this level, individuals can complete tasks involving multiple applications, a large number of steps, impasses, and the discovery and use of ad hoc commands in a novel environment. They can establish a plan to arrive at a solution and monitor its implementation as they deal with unexpected outcomes and impasses.

12   What is meant by skills being seen as a continuum, and not seen as a perspective of minimum proficiency?

The skills assessed in PIAAC are understood as involving a continuum of proficiency. Individuals are considered to be proficient to a greater or a lesser degree in the skill in question as opposed to being either "proficient" or "not proficient". In other words, there is no threshold that separates those who have the competency (or minimum proficiency level in these skills) in question from those who do not. Consequently, the results cannot be used to classify population groups as either "literate" or "illiterate". The measurement scales describe gradations in the complexity of the information-processing tasks in the domains of literacy, numeracy and problems solving in technology-rich environments. In each domain, this complexity is seen as a function of a small number of factors, such as the type of cognitive operations required by the task, the presence of distracting information, and the nature of information and knowledge required to successfully complete a task.

It is important to emphasise that the objective of PIAAC is to see how the adult population is distributed over the entire spectrum of proficiency in each of the domains assessed, not to assess whether adults have achieved a basic level of skills.

13 How can results be compared with results from previous adult skills surveys?

Canada has participated in two previous international studies of adult skills, the International Adult Literacy Survey (IALS) of 1994-1998 and the Adult Literacy and Life Skills Survey (ALL) of 2003-2007 (known in Canada as the International Adult Literacy and Skills Survey of 2003 – IALSS). PIAAC is similar to IALS and ALL but considerably expands the scope of skills measured. Skill comparisons over time are only possible using the re-estimated and re-scaled ALL and IALS data for literacy (prose and document) and numeracy, which will be made available at the PIAAC release on October 8, 2013.

Major differences between PIAAC and IALS and ALL are the following:

PIAAC does not differentiate between the ability to use prose and document texts, whereas it was evaluated separately in both IALS and ALL. PIAAC is the first survey to evaluate use of digital texts and their features (e.g. email, hyperlinks, scrolling) as part of literacy.

Both PIAAC and ALL have numeracy components, while IALS evaluated quantitative literacy. Only data from the numeracy components of ALL (and not IALS) are re-scaled to fit the numeracy scale used in PIAAC to ensure comparability.

The sample size of IALS was smaller than the one of ALL and PIAAC, so it is not always possible to compare detailed estimates with IALS data for specific subgroups of the population and some jurisdictions. Instead, four regions can be compared: the Atlantic provinces, Quebec, Ontario, and the Western provinces. Comparative data for the northern territories are not available. Furthermore, not all countries who participated in PIAAC also participated in IALS or ALL.

Overall, these changes prohibit a direct and immediate comparison of results in PIAAC with those previously reported for ALL or IALS. As a result, one has to be cautious against retrieving the results previously reported for ALL or IALS and comparing them with those in PIAAC: the scales used in the three surveys are not the same, and comparisons are therefore invalid.

In addition, it is worthwhile mentioning that comparisons of skills between surveys are not enough to fully understand differences in skills over time. Additional analysis is required to take into account various socio-economic, demographic and institutional changes between skill assessments.

14   What are the limitations/caveats when comparing results from Canada with other countries, and between provinces and territories?

A great variety of nations participated in PIAAC, and the populations surveyed began their schooling at any time between the early 1950s and the early 2000s — a half-century that has been marked by enormous change. Consequently, comparisons of results between countries and between Canadian provinces and territories should take into account a number of factors that vary by jurisdiction, such as:

- the evolution of education and training systems;
- changes in education policies;
- the development of regional and national economies;
- demographics such as patterns of immigration; and
- changes in social norms and expectations.

In addition to large differences between countries, provinces and territories, there are major differences between populations within them — and these differences can only be understood in a wider context. For example, differences include the socio-demographic composition of their populations; the distribution of residents living in rural areas versus those living in population centres; and the nature of labour markets and local economies. Overall, these factors reflect the diversity of the Canadian population, which inevitably complicate analysis of the results and undermine simple comparisons between jurisdictions.

15   What new skill information does PIAAC bring compared to previous adult skills surveys?

First, it provides an internationally comparable measure of problem solving in technology-rich environments (PS-TRE). In addition to literacy and numeracy, PS-TRE represents a third measure of skills that is essential to processing information. The PS-TRE assessment focuses on the ability to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, as well as accessing and making use of information through computers and computer networks. The aim was not to test the use of ICT tools (e.g., hardware devices, software applications) in isolation; rather, it was to assess the capacity to use these tools to complete concrete tasks effectively.

Second, PIAAC contains a module on the use of skills in which it collects self-reported information on how a range of skills are used at work and in everyday

life, including the frequency and intensity of use. It includes information about the use of:

- cognitive skills, such as engagement in reading, numeracy, and ICT;
- non-cognitive skills (such as the capacity to work collaboratively or as a member of a team), communications skills, organization and planning skills, and influencing skills;
- skills in the workplace, such as autonomy over key aspects of work and what kind of skills are employed at work.

Third, PIAAC also includes an assessment of reading components designed to provide information about adults with very low levels of proficiency in reading. It measures skills in print vocabulary (matching words with the picture of an object), sentence processing (deciding whether a sentence makes logical sense), and passage comprehension (selecting words that make the most sense in the given context).

16   To which extent is PIAAC representative of the Canadian population?

In Canada, over 27,000 adults aged 16 to 65 participated in PIAAC. Respondents were selected in order to obtain a representative sample of people living in each province and territory. Official-language minorities, off-reserve Aboriginal populations and immigrants were oversampled to provide reliable information about these subgroups.

The large sample size of PIAAC, by far the largest among all OECD participating countries, and the oversampling of specific subpopulations allow the production of reliable national, provincial and territorial estimates.

17   Why are adults aged 66 and over not sampled in PIAAC?

The international PIAAC consortium, led by the OECD, has identified the 16 to 65 years old as the population of interest for the survey. The focus on this subsample is to obtain more reliable and accurate estimates of the population covered in PIAAC. This is also a population that is more likely to be active in the labour force than older adults (aged 66 and over).

18   Why only recent immigrants were oversampled in PIAAC? In the previous IALSS all immigrants were oversampled.

Large enough sample size of recent immigrants is required to look at how their skills are distributed across various regions of Canada. Their proficiency in information-processing skills is of particular interest because it provides information on how well-equipped they are to integrate and participate in the Canadian economy and society. Established immigrants represent a significant proportion of the Canadian population and do not need to be oversampled as they are normally represented adequately in national survey.

19   What is meant by going from a 80% probability rating of proficiency in IALLS to a 67% rating in PIAAC?

PIAAC locates individuals on the three proficiency scales using a response probability (RP) value of 0.67. This differs from the approach used in IALS and ALL in which a response probability of 0.80 was used. The change in response probability has no consequences for either the estimation of the proficiency or the precision of the scales. What the change in RP value does affect is the way proficiency is defined and described. In effect, "proficiency" is defined in terms of a different probability of successfully completing tasks. In the case of the shift from an RP value of 0.80 to one of 0.67, the result is that proficiency is described in terms of more difficult items that are completed with a lower probability of success.

In other words, individuals are located on the scale (i.e. the proficiency level) at the point at which he or she has a 67% probability of successfully completing a random set of tasks representing the construct measured.