PISA for Development

Capacity building

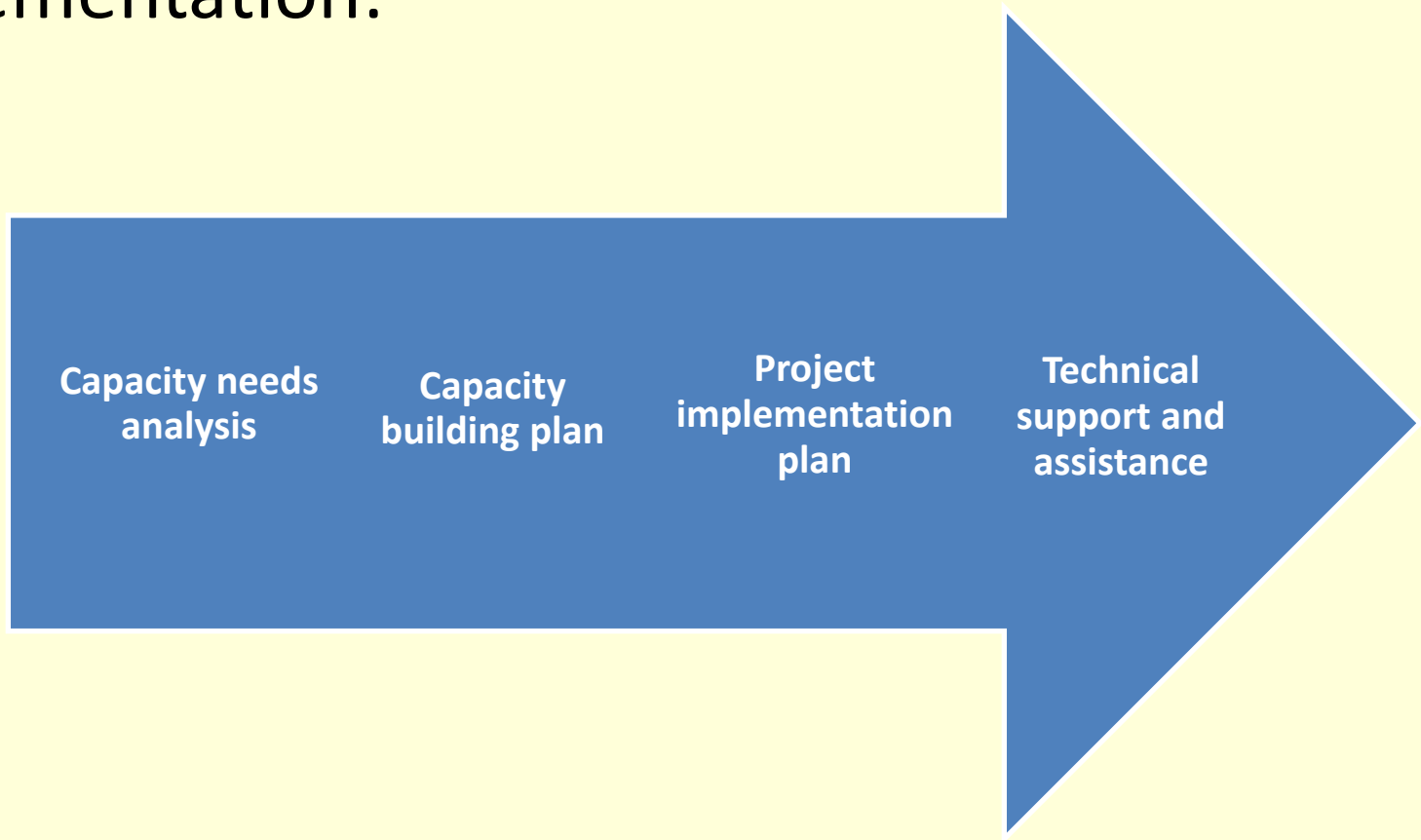
4th meeting of the International Advisory Group
Sokha Angkor Resort – Siem Reap, Cambodia
17-19 May 2017

Capacity Building Activities

- 4th PISA-D objective: country capacity in assessment and analysis strengthened

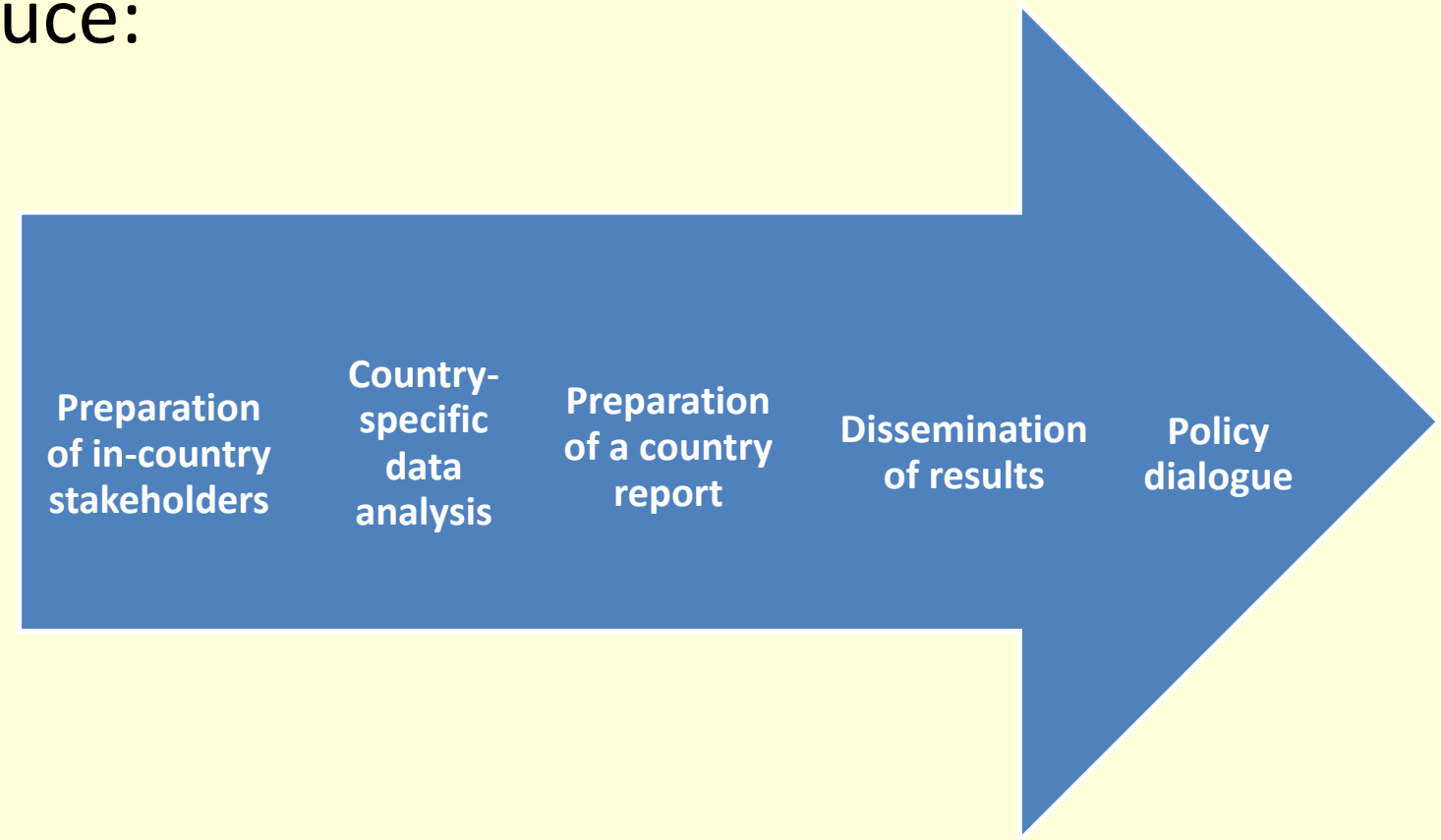
Capacity Building Activities

Preparation for participation and support during implementation:



Capacity Building Activities

OECD support for and collaborative working to produce:



Capacity Building Activities

- **International/NPM meetings and follow-up**
- Manuals, guidelines, procedures – translations of these
- **Peer-to-peer learning and support**
- **Additional training and capacity building workshops and events, engagement and communication efforts**
- Country visits by OECD and contractors
- Support for country specific analysis of results and collaboration with OECD over the writing of a national report and dissemination activities, including support for policy dialogue

International/NPM meetings

Meeting	Venue	Dates	Content	Peers
2015 International Advisory Group meeting (3 days)	Paris, France	11-13 March 2015	Project planning and thematic discussions.	Belgium Spain
International/NPM#1/Capacity Building meeting (5 days)	Quito, Ecuador	28 September – 2 October 2015	PISA cognitive and contextual frameworks, characteristics of the available item pools.	Chile Korea Mexico Peru Uruguay
International/NPM#2/Capacity Building meeting(5 days)	Rockville, MD, United States	25-29 January 2016	Adaptation, translation and verification of survey materials and sampling.	Canada US
2016 International Advisory Group meeting (3 days)	Asunción, Paraguay	30 March – 1 April 2016	Project planning and thematic discussions.	Kosovo
International/NPM#3/Capacity Building meeting (5 days)	Asunción, Paraguay	4-8 April 2016	Student sampling and field trial survey operations.	Brazil

International/NPM meetings

Meeting	Venue	Dates	Content	Peers
International/NPM#4/Capacity Building meeting (5 days)	Livingston, Zambia	4-8 July 2016	Scoring and coder training and data management for the field trial.	China
International/NPM#4a/Capacity Building meeting for Strand C only (3 days)	Madrid, Spain	1-3 November 2016	Quality control sample selection forms, and quality assurance procedures, data management (software, codebook, etc.)	Spain
2017 International Advisory Group meeting (3 days)	Cambodia	17-19 May 2017	Project planning and thematic discussions.	Brazil Kosovo Korea
International/NPM#5/Capacity Building meeting (4 days)	Cambodia	22-25 May 2017	Analysis and interpretation of field trial results and preparation for main study.	Korea
International/NPM#6/Capacity Building meeting (5 days)	Princeton	24-28 July 2017	Student sampling and main study survey operations.	Canada US

International/NPM meetings

Meeting	Venue	Dates	Content	Peers
2018 International Advisory Group meeting (3 days)	Saly, Senegal	2-4 May 2018	Project planning and thematic discussions.	
International/NPM#7/Capacity Building meeting (5 days)	Saly, Senegal	7-11 May 2018	Strands A and B: Data processing, results, scaling methodology and preparation for analysis. Strand C: Main study interviewer training and data management training.	
Residence at OECD for the lead analysts of each country	OECD, Paris	14 May – 20 July 2018	Analysis of data, interpretation of results and drafting of national reports	
International/NPM#8/Capacity Building meeting (8-10 days)	Antigua, Guatemala	23-27 July 2018	Analysis and interpretation of main study results, reporting and dissemination of results.	
International/NPM#8a/Capacity Building meeting for Strand C only (4 days)	Panama City, Panama	16-19 September 2019	Reporting and dissemination of Strand C results.	

Peer-to-peer learning

Peer-to-peer learning

The goals of peer-to-peer learning in PISA-D are:

- help key staff in PISA-D countries to attain the level of project implementation outlined in PISA's Standards, capacity building plans and other project documents,
- enhance the management of large-scale assessments in PISA-D countries,
- provide key staff in PISA-D National Centres with opportunities for professional growth and development,
- provide opportunities for collegial sharing and reflective practice,
- accelerate the capacity building objectives of the project.

Guidelines to support the process

Peer-to-peer learning

Peer learning partnerships:

Peers	Peer Learners
Korea	Cambodia
Uruguay	Ecuador
Peru	Guatemala
Brazil	Honduras
Chile	Paraguay
Canada	Senegal
TBC	Zambia

Peer-to-peer learning

- Peer learning partnerships involving exchange visits, workshops, tele-conferences, email exchanges
- Contributions to international/NPM meetings, IAG meetings, other workshops and training events
- Case studies of participating in PISA, institutional histories of PISA national centres

Additional training and capacity building workshops and events, engagement and communication efforts

Additional training and capacity building workshops and events, engagement and communication efforts

- Project launches and facilitation of project and national engagement and communication strategies
- With IDB, capacity building workshops for Latin American countries on frameworks and item development; Item Response Theory; secondary analysis of data; and communication and engagement with stakeholders
- Item Response Theory workshop for Senegal
- Capacity building workshops and partnership between Cambodia and Korea Institute for Curriculum and Evaluation

Feedback from the countries

- How many members of your team have benefited from participation in an international NPM meeting or other capacity building event since the last IAG? How did you disseminate what you learnt at these meetings to other members of your team?
- For Zambia, what was it like to host an NPM meeting? What advice would you give to future hosts?
- For Cambodia (and Korea) what progress have you made with capacity building workshops?
- For the Latin American countries (and IDB) what progress have you made with capacity building workshops?

Feedback from the countries

- How are the peer-to-peer learning partnerships working out?
- Which aspect of the project so far has been most helpful in building your capacity? Has this benefited in any way your national assessment?
- What are you most looking forward to in the next 12 months for capacity building?
- Are there any important areas of capacity building included in your plans that the project or other partnerships not yet addressing or planning to address?

PISA for Development
Assessment and Analytical Framework

4th meeting of the International Advisory Group
Sokha Angkor Resort – Siem Reap, Cambodia
17-19 May 2017

Content and purpose

- The framework answers the question “what does PISA-D assess and how?”
- It reviews in detail PISA and the contributions of PISA-D that enhance PISA to make it more relevant to middle- and low-income countries
- Also provides a brief general introduction to the methods, questions and general operations used in the assessment
- Guides test development, questionnaire development and interpretation of results
- Key publication that will form the basis for various communication tools targeted at different audiences

Process and timeline

- The framework has been a collaborative effort involving Pearson, ETS, TLB, the Questionnaire Expert Group (QEG), the Subject Matter Expert Groups, the participating countries and the OECD through 2015 - 2017

- Publishing timeline:
  - On-line version to be published in September 2017
  - Updated after the main data collection
  - Final online version and published by the OECD as a book in early 2019

Structure of assessment framework

- Based on the PISA 2015 framework

- Five chapters:
  - Chapter 1. What are PISA and PISA for Development?
  - Chapter 2. PISA for Development Reading Framework
  - Chapter 3. PISA for Development Mathematics Framework
  - Chapter 4. PISA for Development Science Framework
  - Chapter 5. PISA for Development Contextual Questionnaires Framework

Chapter 1 What are PISA and PISA for Development

- Overview of the project, describing:
  - Its goals
  - PISA and PISA-D
  - the school based and out-of-school assessment
  - an overview of what is assessed in each cognitive domain
  - the contextual questionnaires and an overview of their frameworks
  - the timeline of the project
  - capacity building for the countries

Chapters 2, 3 and 4
Cognitive frameworks

- Enhanced PISA frameworks for reading, mathematics and scientific literacy provide more detail on the foundational knowledge and skills that underlie performance in PISA
- Based on the PISA framework, maintain full range of the PISA scale, allow for the results to be comparable with international PISA results
- For each domain, define the knowledge and skills that students need to acquire, identify the cognitive processes that sustain performance, and describe the contexts in which knowledge and skills are applied
- Science and Mathematics based on the PISA 2015 framework, Reading based on PISA 2012 framework (CBA in 2015)
- No subscales, so those sections that are not relevant to the PISA-D framework have been omitted or made briefer

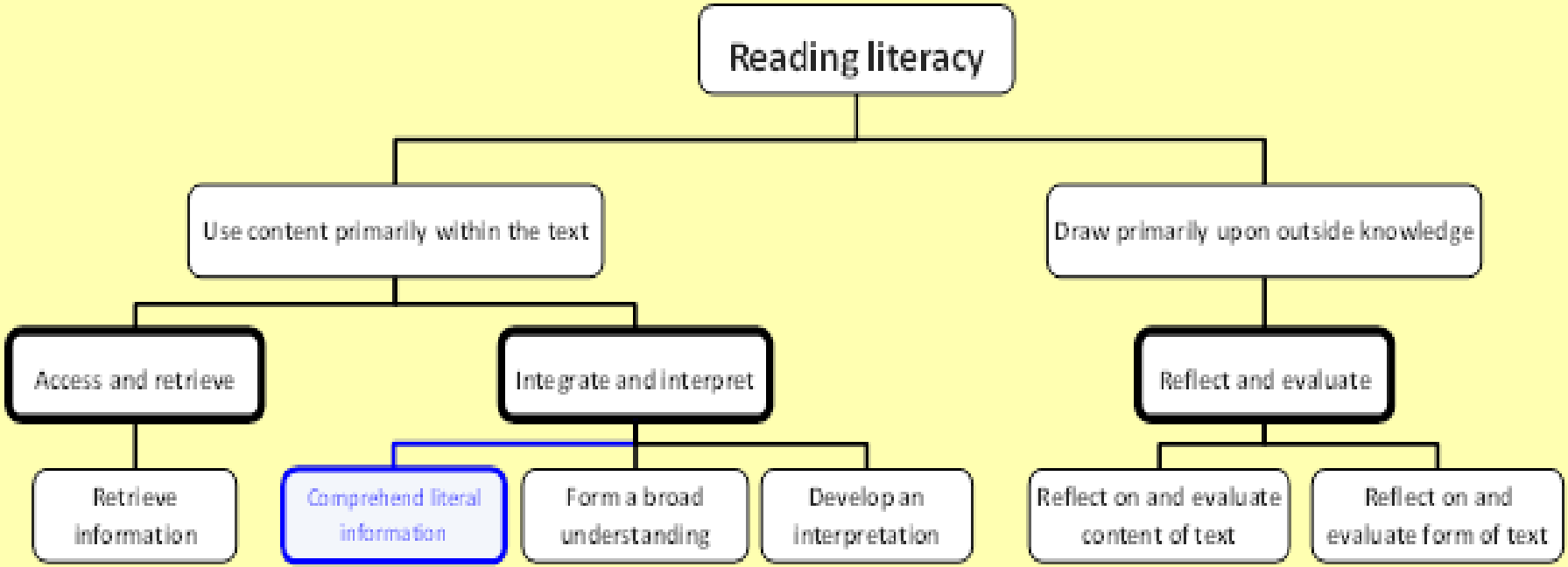
Chapter 5 Contextual Questionnaires Framework

- Describes the theoretical approach, instruments, and variables that will be measured for the school based and the out-of-school assessments, explaining:
  - The Education Prosperity framework that shaped the enhancements made to the contextual questionnaires for PISA-D
  - the selection and organisation of the core content of the PISA-D instruments, structured in 14 modules and one contextual category
  - how the modules have been implemented in PISA-D, highlighting enhancements in the questions/approach
- While in the cognitive chapters most of the text comes from PISA, this chapter focuses on the enhancements

Reading framework

- The PISA reading assessment is built on three main task characteristics:
  - Processes (aspects) – the cognitive strategies, approaches or purposes that readers use to negotiate their way into, around and among texts
  - Text – the range of material that is read
  - Situation – the range of broad contexts or purposes in which reading takes place
- The *text* and *situation* variables for PISA-D are the same as those used in the main PISA test, but PISA-D has enhanced the *processes*

Processes



- Processing the literal meaning of a text is a foundational competency. PISA-D adds a process called “literal comprehension” that requires students to comprehend explicitly stated information that may be found in individual words, sentences or passages
- In addition, the concept of “retrieving information” is broadened to a range from locating explicitly stated individual pieces of information, such as individual words or phrases, to finding information in long passages

Task distribution

- The distribution of tasks across the major framework variables of situation and text should closely mirror the distributions used for the print items in PISA 2012
- The distribution of process variables puts greater emphasis on access and retrieve, most particularly at the lower levels of proficiency, and lower emphasis on reflect and evaluate

Distribution of score points in reading, by processes, for PISA 2012 (approximate distribution) and PISA-D (desired distribution)

Processes (aspects)	Percentage of total score points in PISA 2012: print	Percentage of total score points in PISA-D
Access and retrieve	22	25-30% with 15% below Level 3
Integrate and interpret	56	45-55%
Reflect and evaluate	22	15-25%
Complex	0	0
Total	100	100

Reading proficiency levels

- Level 1c is added as the lowest level of proficiency with a focus on understanding words, short phrases and extracting literal meaning from sentences:

"Tasks at this level require a reader to understand the meaning of individual written words and short phrases. The tasks require students to locate a single word or phrase in a short list or text, to recognise the printed forms of common objects and concepts, or to extract the literal meaning of individual sentences and very short syntactically simple passages with familiar contexts. Texts support students with explicit pointers to the information and with repetition, pictures or familiar symbols with limited competing information"

Reading components

- Reading components are the sub-skills, or building blocks, that underlie reading literacy (Oakhill, Cain and Bryant, 2003)
- The PISA-D framework incorporates the reading components of word comprehension, sentence processing and passage comprehension, providing additional emphasis on the basic components of the cognitive processes that underlie reading skills
- More basic reading components, such as the visual recognition of the printed elements of the alphabet, decoding words into sounds and basic oral comprehension, are not included
- Approach is based on reading components from the Programme for the International Assessment of Adult Competencies (PIAAC) and an optional component of PISA 2012

Reading components example item

The sentence processing tasks assess the ability to comprehend written sentences of varying lengths. This item likely corresponds to proficiency Level 1c.

Directions: Circle **YES** if the sentence makes sense. Circle **NO** if the sentence does not make sense.

The red car had a flat tire.	**YES**	**NO**
Airplanes are made of dogs.	**YES**	**NO**
The happy student read the book last night.	**YES**	**NO**
If the cat had stayed out all night, it would not have been in the house at 2 a.m.	**YES**	**NO**
The man who is taller than the woman and the boy is shorter than both of them.	**YES**	**NO**

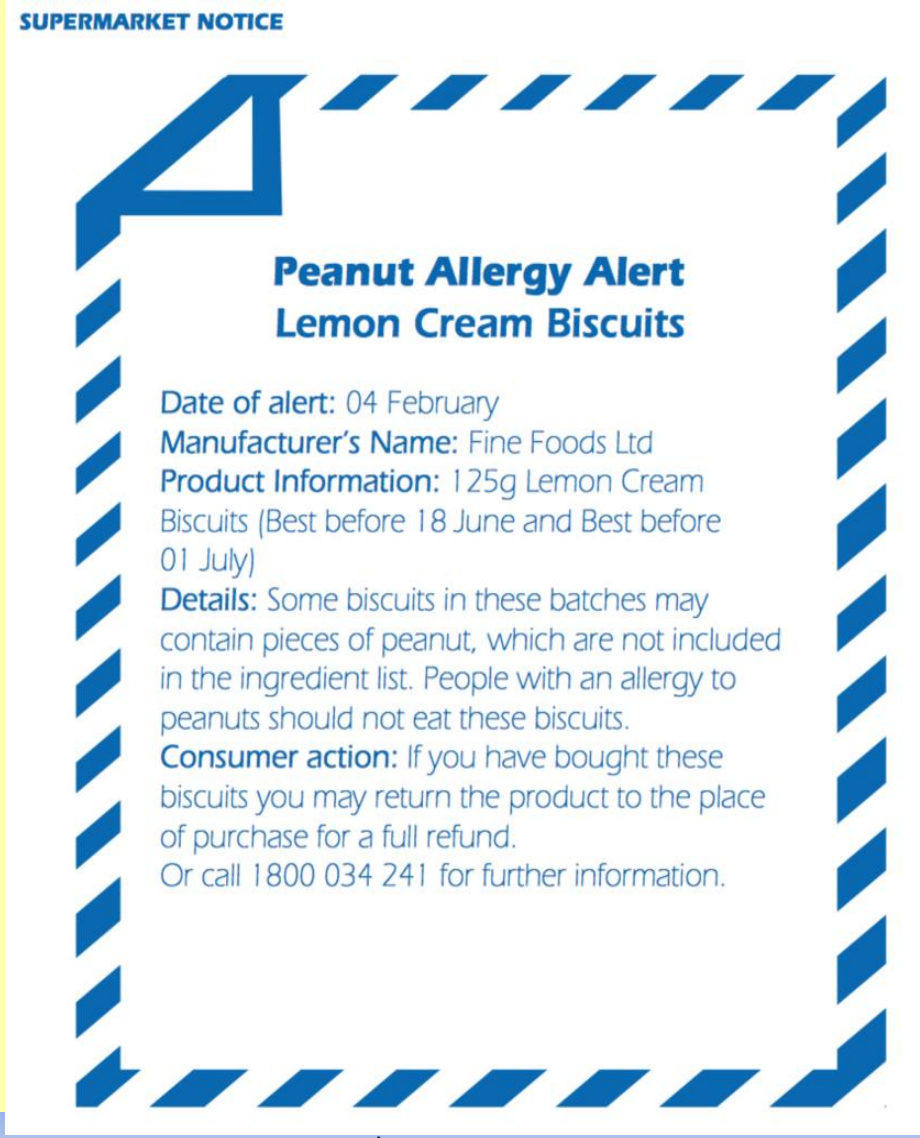
Level 1.c illustrative item

Sample item 5 is a released PISA item that assesses basic access and retrieve processes.

Question 3 requires a small inference since the text says “manufacturer” rather than “company”. The item would likely be at Level 1b of proficiency.

If it were modified to “What is the name of the manufacturer that makes the biscuits?”, then the item would require a literal match and would be considered at a Level 1c.

Question 3
What is the name of the company that made the biscuits?


SUPERMARKET NOTICE

Peanut Allergy Alert
Lemon Cream Biscuits

Date of alert: 04 February
Manufacturer's Name: Fine Foods Ltd
Product Information: 125g Lemon Cream Biscuits (Best before 18 June and Best before 01 July)
Details: Some biscuits in these batches may contain pieces of peanut, which are not included in the ingredient list. People with an allergy to peanuts should not eat these biscuits.
Consumer action: If you have bought these biscuits you may return the product to the place of purchase for a full refund.
Or call 1800 034 241 for further information.

Mathematics framework and mathematical literacy

- To extend the framework it would seem quite natural to concentrate on some very basic “numeracy skills” such as fluency in performing simple arithmetical operations
- However, the PISA 2015 definition of mathematical literacy is an individual’s capacity to formulate, employ, and interpret mathematics in a variety of contexts
- From this perspective, mastering the most basic technical skills is not enough, this knowledge must be put to use
- The extensions to the PISA mathematics framework aim at expanding coverage at the lower ability levels by using more straightforward, simply formulated items, suggesting a very careful analysis of students’ attempts to solve the problem and testing the ability to choose the right model and select a strategy or an explanation
- The enhancements focus on 3 aspects: proficiencies, processes, and skills

1. Proficiencies

PISA-D differentiates performance at the lowest level by breaking down Level 1 into three sub-levels: 1a, 1b and 1c.

At Level 1b students can understand questions involving everyday contexts where all relevant information is clearly given and defined in a short syntactically simple text. They are able to follow clearly prescribed instructions. They can perform the first step of a two-step solution of a problem.

At Level 1c students can understand questions involving simple, everyday contexts where all relevant information is clearly given and defined in a very short syntactically simple text. They are able to follow a single clearly prescribed instruction. They can solve problems limited to a single step or operation.

2. Processes

- PISA-D extends the descriptions to better describe students' attempts to apply mathematical processes of the processes
- The approach taken acknowledges that before students may be fully capable of utilising processes, they must first be able to identify and select an appropriate model, strategy or argument

Process	Activity added for PISA-D
Formulating situations mathematically	• Selecting an appropriate model from a list.
Employing mathematical concepts, facts, procedures, and reasoning it adds	• Performing a simple calculation • drawing a simple conclusion • selecting an appropriate strategy from a list.
Interpreting, applying and evaluating mathematical outcomes it adds	• Evaluating a mathematical outcome in terms of the context.

3. Skills

- Based on the modifications to the proficiencies and processes for PISA-D, it was necessary to add particular skills to support these modifications. Four skills were added:
  - select a model appropriate to the context of real-world problems
  - select a representation appropriate to the context
  - select an appropriate justification
  - implement a given strategy

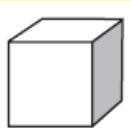
Recommendations for new 1b and 1c mathematics items

- Context and language should not interfere with the mathematics being assessed:
  - The context should be situations that students encounter on a daily basis and the understanding of the context should not interfere with the performance of the item
  - Items should be formulated in the simplest possible terms: short and direct sentences, easy vocabulary
- Items should be concrete and not abstract
- Items designed for Level 1c should just ask for a single step or operation, not limited to an arithmetical step. This step might be demonstrated by making a selection or identifying some information
- All parts of the modelling cycle can and should be used to measure mathematical abilities of students at Levels 1b and 1c

Sample item level 1.c

- For this item, the student needs to determine the number of small cubes needed to build the larger block. In doing this, the process “applying mathematical facts, rules, algorithms, and structures when finding solutions” is addressed. Since this is a simple, one-step problem, it meets the requirements of proficiency 1c.

Susan likes to build blocks using small cubes like the one shown in the following diagram:



Small cube

Susan will build a block as shown in Diagram A below:

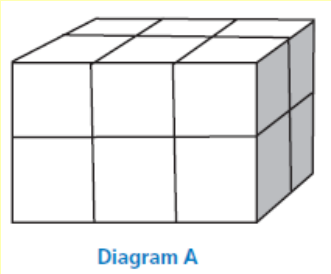


Diagram A

How many small cubes will Susan need to build the block shown in Diagram A?

Sample item levels 1.c and 1.b

Mei-Ling found out that the exchange rate between Singapore dollars and South African rand was

1 SGD = 4.2 ZAR

Mei-Ling changed 3000 Singapore dollars into South African rand at this exchange rate. Choose a correct method from those listed. Then calculate n, the amount of South African rand Mei-Ling received after the exchange.

$$\frac{1}{4.2} = \frac{n}{3000} \qquad \frac{1}{3000} = \frac{4.2}{n} \qquad 4.2n = 3000 \qquad n = 3000(4.2)$$

- For this item, the student is given 4 methods to solve for *n*. Two of these methods will result in a correct value for *n*. This addresses the added process "selecting an appropriate model from a list."
- If a student is able to choose one of the correct methods, the requirements for proficiency 1c are met. If a student is also able to solve for *n* correctly, the requirements for proficiency 1b are met.

Testing reading and mathematical literacy among the out-of-school population

- The extended Reading and Mathematic PISA-D frameworks are appropriate for 15-year-old students whether in or out of school

In Mathematics

  - Contexts of the items were reviewed to ensure appropriateness for what individuals would encounter in an out-of-school context

In Reading

  - The units and items are not directly school contextually-based, so can be maintained the same for in-school and out-of-school populations
  - Though the out-of-school component is assessed on a tablet computer, only fixed-text items are used, so it is appropriate to use the same framework as for the paper based test

Delivery mode for the out-of-school

- For mathematics and reading, to ensure comparability the out-of-school tablet based instruments for PISA-D are formed by a subgroup of the items used for the school based paper assessment.
- These items were originally designed for a paper based assessment, so care was taken when moving to a tablet based delivery to maintain comparability
  - The majority of response formats remains unchanged
  - Pagination is used for texts rather than scrolling to allow for as much text as possible to be immediately visible to the reader
  - IT skills such as knowledge of basic hardware and basic conventions kept to a minimal core level

Assessing scientific literacy

The enhancements to the PISA science framework in PISA-D focus on three aspects of science literacy:

- *Proficiencies* – PISA 2015 differentiated performance at the lowest level by breaking Level 1 into two sub-levels: 1a and 1b. PISA-D creates Level 1c as the new lowest level
- *Competencies* – PISA-D provides a detailed description of each of the three PISA competencies for proficiency Levels 1a, 1b and 1c. It also provides descriptions of the kind of task that students can do and cannot do
- *Skills* – PISA-D identifies the skills necessary to perform at the lowest proficiency level

Proficiency levels

- Level 1c is added as the lowest level of proficiency

"At Level 1b, students can use basic or everyday scientific knowledge to recognise aspects of familiar or simple phenomenon. They are able to identify simple patterns in data, recognise basic scientific terms and follow explicit instructions to carry out a scientific procedure"

"At Level 1c, students can use an element of basic or everyday scientific fact "

Competence Explain phenomena scientifically

All Level 1 students should be able to demonstrate some ability to explain phenomena scientifically:

- Level 1c requires recognising explanations for a limited range of the most simple natural and technological phenomena demonstrating the ability to recall appropriate scientific knowledge.
- Level 1b requires recognising explanations for a range of simple or familiar natural and technological phenomena demonstrating the ability to identify an explanatory model or representation, and recognise the potential implications of scientific knowledge for society and individuals.
- Level 1a requires recognising explanations for a range of simple or familiar natural and technological phenomena demonstrating the ability to make appropriate predictions, recognise an appropriate explanatory hypothesis and recognise simple causal or correlational relationships.

Examples of tasks for Explain phenomena scientifically

- At Level 1c students can be required to:
  - Identify what are the elements of a standard representation that are used in science. For instance, a question might present an unlabelled diagram of an object and students could be asked to add the appropriate labels from a list provided by the question.
  - Recall appropriate scientific knowledge but not apply such knowledge. For instance, a student might be asked to identify which scientific phenomenon is being described in an item.
- At Level 1b students can be required to:
  - Recall appropriate scientific knowledge but not to apply such knowledge. For instance, a question might ask which one of several familiar scientific concepts from a list would explain a simple phenomenon described at the beginning of the question.
  - Use a familiar piece of scientific knowledge. For instance, a question about the freezing point of water might ask students to determine whether water will freeze in a given context.
- At Level 1a students can be required to:
  - Make a simple prediction but not justify it. For instance, a question might ask which of several predictions might be correct, or students could be asked to predict the reading of an ammeter on a simple circuit where the reading on one ammeter is provided and the other is not.
  - To identify from a list what the evidence is that supports a particular claim, e.g. that a rock is a sedimentary rock or that a whale is a mammal rather than a fish.
  - Provide descriptive explanations of the properties of objects or substances – for instance that a rock must be sedimentary because it can be easily scratched.

Competence to interpret data and evidence scientifically

- The higher cognitive demand means that this competency is generally above Level 1c.
- Level 1b requires recognising a specific scientific claim, justification or data set in a simple or familiar context, demonstrating the ability to identify the evidence, claim or justification in a science-related text and identify simple patterns in data
- Level 1a requires recognising specific scientific data, claims, and justifications in simple or familiar contexts and identify an appropriate conclusion demonstrating the ability to:
  - Recognise an appropriate conclusion that can be drawn from a simple set of data
  - Extract a specific piece of information from a scientific text
  - Identify a non-scientific argument
  - Interpret graphical and visual data
  - Identify simple causal or correlational relationships

Competence Evaluate and design scientific enquiry

- The higher cognitive demand required to evaluate and design scientific enquiry means that this competency is generally above Level 1c and attained only to a limited extent by Level 1b students
- Level 1b requires appraising simple scientific investigations, demonstrating the ability to carry out a simple scientific procedure when provided explicit instructions and determine which of several variables is the dependent variable in an investigation
- Level 1a requires appraising simple scientific investigations and recognise ways of addressing questions scientifically, demonstrating the ability to:
  - Identify the question explored in a simple scientific study
  - Distinguish a question that is possible to investigate scientifically from one that is not
  - Evaluate if one way of exploring a given question is scientifically appropriate
  - Recognise appropriate measures for a scientific quantity (units appropriate for measuring)
  - Identify a source of error in a measurement or a flaw in an experimental design

Foundational skills

In order to enter Level 1c performance a student must have the foundational skills required to:

- Read and comprehend simple sentences
- Use numeracy and basic computation
- Understand the basic components of tables and graphs
- Apply the basic procedures of scientific enquiry
- Interpret simple data sets

Recommendations for level 1.c science items

Items should:

- Be familiar to students' everyday lives or draw on ideas that permeate contemporary culture
- Draw on macroscopic phenomena that students may have experienced or observed or learned in the curriculum
- Be formulated in the simplest possible language: Sentences should be short and direct. Lengthy sentences, compound nouns, and complex phrasing should be avoided. Vocabulary used in the items must be carefully examined to avoid the use of academic language and, wherever possible, simplify the scientific language
- Wherever possible, the cognitive processing should only require one-step reasoning and use simple data or descriptions

Testing scientific literacy in the out-of-school population

- While PISA-D's out-of-school component does not include the science domain, this framework is applicable for students who are in school as well as for 15-year-olds that are out of school

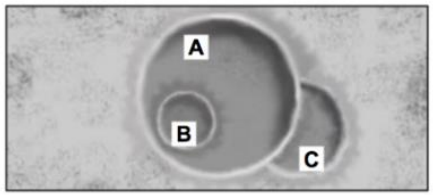
Science sample item level 1b

PISA 2015

Meteoroids and Craters
Question 3 / 3

Refer to "Meteoroids and Craters" on the right. Use drag and drop to answer the question.

Consider the following three craters.



Put the craters in order by the size of the meteoroids that caused them, from largest to smallest.

Largest →		Smallest
A	C	B

Put the craters in order by when they were formed, from oldest to newest.

METEOROIDS AND CRATERS

Rocks in space that enter Earth's atmosphere are called meteoroids. Meteoroids heat up, and glow as they fall through Earth's atmosphere. Most meteoroids burn up before they hit Earth's surface. When a meteoroid hits Earth it can make a hole called a crater.

Competency Interpret Data and Evidence Scientifically.
Given a simple set of observations, the item requires to draw a correct inference

Chapter 5 Contextual Enhancements to the PISA questionnaires

- The PISA questionnaires do not always capture the most relevant contextual factors for middle- and low-income countries
- The PISA-D questionnaires maintain comparability with PISA on a set of core indicators and enhance the questionnaires to better measure factors that are more strongly related to student performance in middle- and low-income countries
- PISA-D maintains the four broad areas identified in PISA 2012 framework: outcomes, student background, teaching and learning processes, and school policies and educational governance
- The PISA-D questionnaire framework takes into account the goals of PISA-D, lessons from past PISA cycles and other international studies, recommendations from research literature and the priorities of the participating countries

Questionnaire assessment framework

- The enhancements use an adapted version of the Educational Prosperity approach as an overarching framework:
  - A life-course approach that includes a core set of metrics for success at six key stages of development, covering the period from conception to adolescence
  - Identifies a key set of outcomes, called “Prosperity Outcomes”, a set of family, institutional and community factors, called “Foundations for Success”, which drive these outcomes, and demographic background factors relevant to assessing equality and equity
- PISA-D adds some context measures to gather data on other teacher, school and system-level background variables that are expected to help explain student outcomes but are not included in one of the previous modules
- Emphasis on equality and equity

SES

- The measure of economic, social and cultural status (ESCS) used by PISA does not adequately capture lower levels of parental education and income or the risk factors associated with poverty that are more frequent in low-income countries

- The PISA-D contextual framework and questionnaires focus on the measurement of socio economic status and poverty by extending the measure of the PISA ESCS and exploring an international measure of poverty for youth in middle- and low- income countries

14 modules plus context factors

The framework for the PISA-D questionnaires focuses on 14 modules of content, plus the teacher, school and system level context factors

1. Prosperity Outcomes	1.1 Academic performance (measured through the PISA-D tests)
	1.2 Educational attainment
	1.3 Health and well-being
	1.4 Student engagement
2. Foundation of Success	2.1 Inclusive environments
	2.2 Quality instruction
	2.3 Learning time
	2.4 Material resources
	2.5 Family and community support
3. Demographic factors for assessing equality and equity	3.1 Gender
	3.2 Disability
	3.3 Immigrant status
	3.4 Socioeconomic status and poverty
	3.5 Language spoken at home and language of instruction
4. Context factors	

PISA-D questionnaires

- The school-based instruments:
  - Student questionnaire
  - Teacher questionnaire
  - School questionnaire (answered by principals of schools)
- The out-of-school instruments:
  - Youth questionnaire (14 to 16 year olds)
  - Person most knowledgeable questionnaire (parents)
  - household observation schedule (answered by the interviewer)
- System-level questionnaire

Assessing the out-of-school population

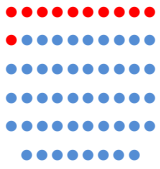
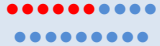
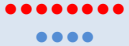
- PISA-D introduces an out-of-school assessment
- Allows for the combination of data for the in-school and out-of-school populations
- The out-of-school instruments gather much of the same data as the school-based instruments as well as data on barriers to school attendance and factors that may impede students' progress through school
- In general, out-of-school youth tend to be poorer than those attending school – many of them are in the lowest quintile: PISA-D's approach to measuring ESCS and poverty is especially important for this population
- The questionnaire completed by the person most knowledgeable about the youth (PMK) asks about some elements of the early life-course foundations, such as the nutrition and health of the biological mother during pregnancy and the engagement of the family during the preschool years

Distribution of questions in the PISA-D questionnaires

	School-based assessment (MS)			Out-of-school assessment (FT)		
	Student	Teacher	School	Youth	Person Most Knowledgeable	Household
Prosperity Outcomes						
Educational Attainment	●●●●			●●●●●●●●●● ●●●●●●●●●●	●●●●	
Health and well-being	●●●●			●●●●		
Student engagement	●			●●	●	
Foundations for Success						
Inclusive environments	●●●●	●●	●●●●	●●●		
Quality instruction	●●●	●	●			
Learning time	●●●●●	●	●●	●●		
Material resources		●●●●●●	●●●●●			
Family and community support	●	●	●●	●	●	

Red dots indicate questions that can be linked with PISA 2015 and blue dots questions that are new to PISA-D

Distribution of questions in the PISA-D questionnaires (continued)

	School-based assessment			Out-of-school assessment		
Demographic factors to assess equity and equality						
Gender						
Language spoken at home						
Disability						
Immigrant status						
Socioeconomic status and poverty						
Context factors						
Total	**49**	**33**	**28**	**102**	**22**	**17**

- Questions?
- Comments?

A model for assessing equality and equity

- PISA-D defines inequality as differences among sub-populations in the distribution of their educational outcomes, while equity, a normative concept, requires also an assessment of fairness based on the observed differences among sub-populations in their access to the resources and schooling processes that affect schooling outcomes
- In this framework, equality is measured by the differences among groups in the distribution of Prosperity Outcomes, while equity requires measures of whether children from different groups have fair access to the five foundations of success. Unfair access to the foundation factors increases inequalities in outcomes
- Equity is a normative concept that is best assessed in relative terms – by comparing the levels of inequality in outcomes and in access to the foundations of success to those achieved by other countries, in comparable circumstances
- The PISA-D questionnaires collect information on several demographic factors that impact equality and equity and are relevant to both the in-school and the out-of-school populations. The framework focuses in particular on gender, disability, immigrant background, socioeconomic status and poverty and language

Equality, equity and the out-of-school

- A prerequisite to benefit from all school-related Foundations for Success is to be in school, therefore, access pertains to equity: do children from various sub-populations differ in their access to inclusive environments, quality instruction, learning time and material resources?
- Access also has to do with equality: do children from various sub-populations differ in their distribution of the outcomes attainment and performance?

PISA for Development
Analysis and Reporting Plan

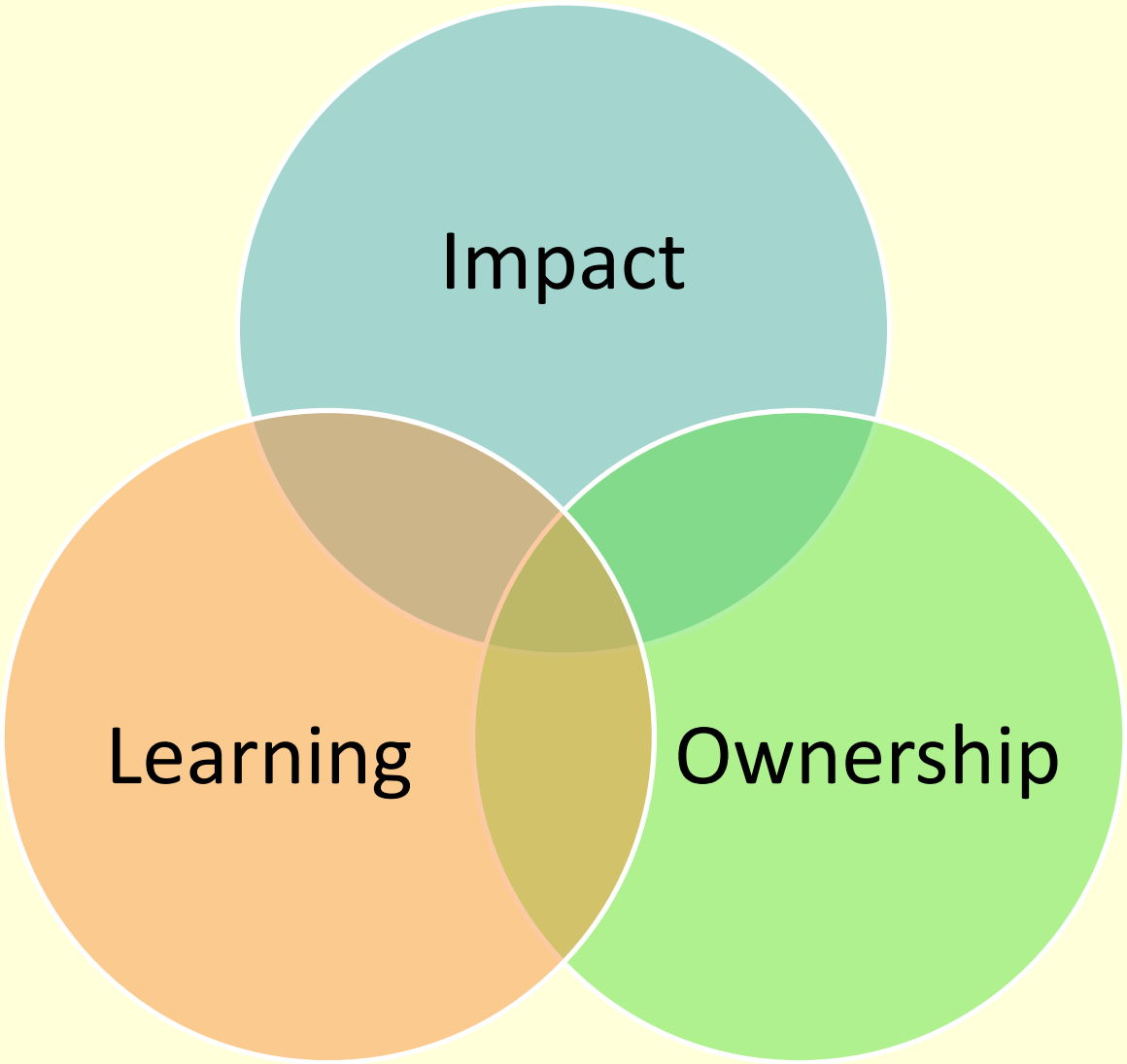
4th meeting of the International Advisory Group
Sokha Angkor Resort – Siem Reap, Cambodia
17-19 May 2017

PISA-D Analysis and Reporting Plan

Today's plan

- **Why** is analysis and reporting a key strategic goal in PISA-D?
- **How** will this plan achieve its objectives and produce all these elements?
- In-depth discussion of the revised outline for **National reports**

Why is analysis/reporting important?



Why is analysis/reporting important?

1. **Ownership:** PISA-D aims to build in-house capacity for generating evidence-based policy advice in participating countries.

2. **Impact:** PISA-D aims to help improve quality and equity in education, providing tools and advice to improve policy design and implementation

3. **Learning:** PISA-D promotes learning on how to make use of large scale assessments for stakeholder engagement and policy dialogue

How will analysis/reporting work?

The key strategies in the proposed approach are…

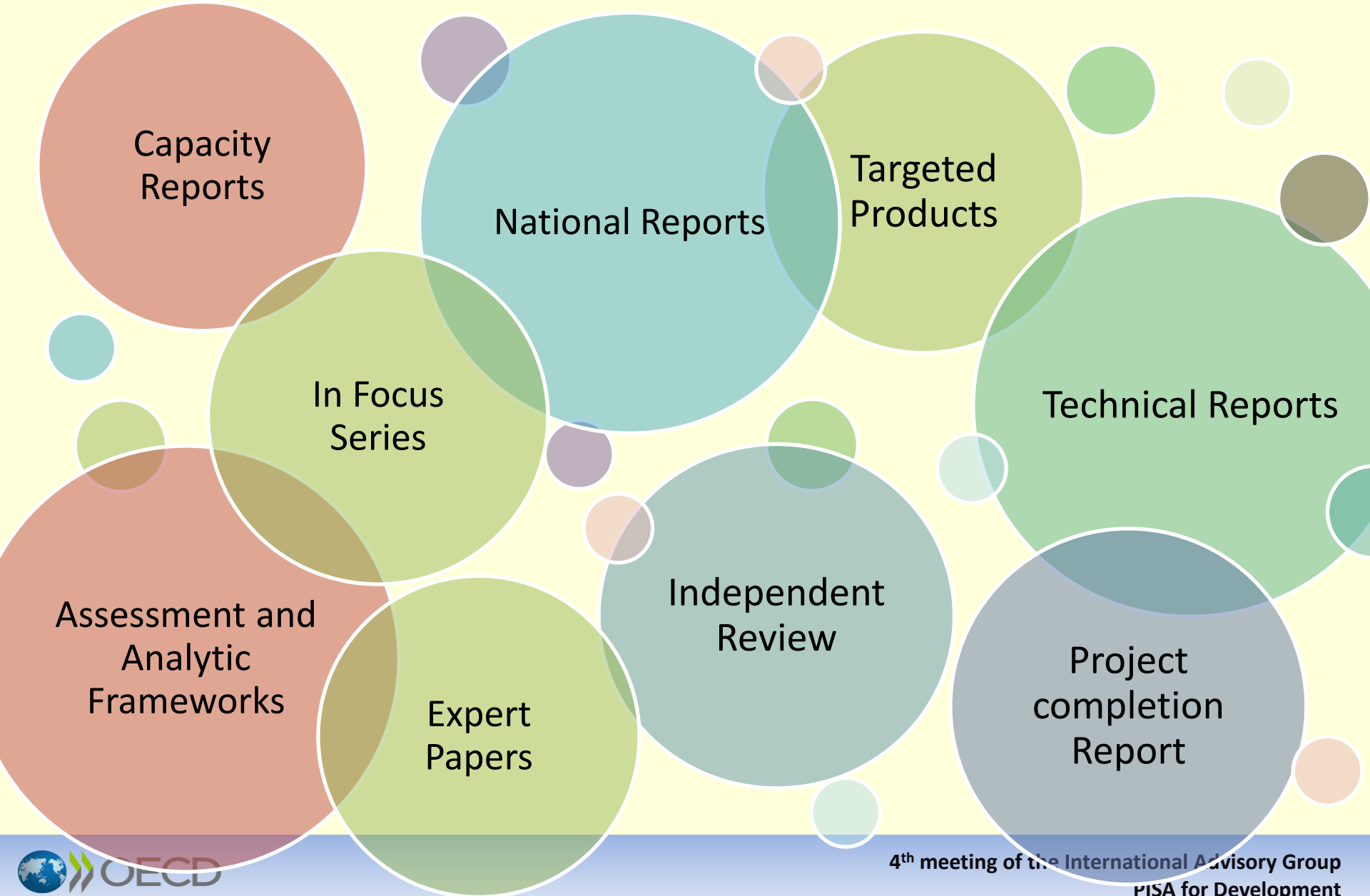
1. **Collaborative** partnership between participating countries, the OECD Secretariat and its partners, and international contractors

2. **Comprehensive** approach to systematically and transparently document all steps in the process

3. **Flexible** design targeting different audiences with differentiated products

4. **Timely** delivery of products through careful planning and monitoring of tasks and deliverables

What analysis/reporting products?



National Reports

- **Why?** Key **output** of the project to galvanize debate on policies for improvement based on **evidence** collected in PISA-D
- **What?** A **comprehensive** report, written for a wide audience, with all the key results from the project (including out-of-school youth, if available), that speaks to country specific policy **priorities**
- **How?** Produced in **collaboration** between the countries, the OECD Secretariat, and the international contractors
- **When?** Launched in December 2018, preparation **already underway**

National Reports – Draft Outline

Proposal for discussion

Chapter

1: ***Zedland* in PISA for Development**

Pillars of educational prosperity in Zedland

2: **Achievement and attainment outcomes at age 15**

3: **Health, well-being and engagement at age 15**

Foundations for success in Zedland

4: **The school and community environment**

5: **Resources invested in education**

6: **Policy options in Zedland**

Part I: Executive Summary and Overview

E.S. **Executive summary**

- Focus on core measures of success and key foundations for success
- Infographics and “snapshot” tables
- PISA-D and SDGs

Ch.1 **Zedland in PISA-D**

- What is PISA-D
- The zedlandian education system and comparisons with selected countries
- Framework for analysis

Part II: Pillars of educational prosperity (1)

Ch.2 **Achievement and attainment outcomes at age 15**

- **Levels of attainment** at age 15 in Zedland
- What *Zedland* students (and youth) **know and can do**
- **Variation** across regions and schools (rural/urban)
- Achievement and attainment in **international perspective**
- **Equality** of attainment and achievement (by gender, socio-economic status, immigrant status, language spoken at home, disability)
- Strengths and challenges – *students with* poor reading skills *and policies related to language of instruction*
- How educational careers of students on-track and behind track differ: *Pre-school attendance, grade repetition and long-term absenteeism*

PISA 2015 Results: Volume I as starting point for analysis

Part II: Pillars of educational prosperity (2)

Ch.3 **Success beyond academic outcomes in Zedland**

- Health and well-being
  - **Levels** of life satisfaction, health status and **prevelence** of anxiety and depression at age 15 in Zedland
  - **Variation** across regions and schools (rural/urban)
  - Life satisfaction in **international perspective**
  - **Equality** of health and well-being (by gender, socio-economic status, immigrant status, language spoken at home, disability)
  - Health problems among 15-year-olds
- Student engagement
  - **Levels, Variation and Equality** of student engagement
  - Student engagement in **international perspective**

PISA 2015 Results: Volume III as starting point for analysis

Part III: Foundations for success (1)

Ch.4 **The school and community environment**

- The **school** environment: learning time and inclusive environments
  - **Loss of learning time, sense of belonging** and **feelings of safety** in Zedland and in international perspective; variation and equity
- The **classroom** environment: quality of instruction
  - **Structured lessons in maths**, **teacher support** (reported by students), **disciplinary climate** in Zedland and in international perspective; variation and equity
- The **wider** learning environment
  - **Family and community support** in Zedland and in international perspective; variation and equity

…

Part III: Foundations for success (2)

Ch.4 **The school and community environment**

…

- Research on the effects of the school and community environment
- Potential interventions to increase learning time, create inclusive environments, improve the quality of instruction and enhance family and community support

PISA 2015 Results: Volume II (Chapter 3) as starting point

Part III: Foundations for success (3)

Ch.5 **Resources invested in education**

- **Financial** resources
  - *Expenditure per student* and PISA performance
- **Material** resources
  - Levels of material resources; variation and equity (by school advantage/disadvantage)
- **Human** resources
  - Class size, student-teacher ratios, *teacher salaries* and teacher professional development; variation and equity (by school advantage/disadvantage)

PISA 2015 Results: Volume II (Chapter 6) as starting point

NB: measures in *italics* are at system level; all other measures at school level

Part IV: Policy options for Zedland

Ch.6 **Policy implications of PISA-D results**

- Summary of findings
  - Learning outcomes, foundations for success, access, equality and equity
- Altering the allocation of resources
  - Research findings
  - Learning from other countries
- Altering structural features of schools
  - Research findings
  - Learning from other countries
- An agenda for reform in Zedland

National adaptations of the reports

- Chapter 1 – Zedland in PISA-D
- Choosing a set of comparator countries (from PISA and PISA-D)
- Selecting in-depth analyses according to policy priorities
- Choosing and key equality/equity dimensions

…

Timeline

First review of proposed **outline** and **table shells**	2016
Preliminary **field trial results** for Strand A/B	17-19 May 2017 (IAG Cambodia)
Review of **revised outline and table shells** (based on final instruments for Strand A/B)	July 2017
Collaborative writing: OECD, international contractors and country	1 January - 8 October 2018
Presentation of preliminary Main Survey results for Strand A/B and initial chapters	2-4 May 2018 (IAG Senegal)
Training on data processing steps and methodology for analyses	7-11 May 2018 (NPM Senegal)
Residence in OECD Paris for seven lead analysts from the participating countries: capacity building, analysis of data and report writing	14 May - 20 July 2018
Training on analysis, interpretation, reporting and dissemination	23-27 July 2018 (NPM Guatemala)
Review of draft reports by country teams	30 July - 13 August 2018
Finalisation of national reports by country teams with OECD support	13 August - 30 September 2018
Drafting ends and production of reports for publication (e.g. layout, etc.) and of specific dissemination materials begins	8 October 2018
Publication and dissemination of national reports in each country with final results from Strands A/B	1- 31 December 2018
Analysis, interpretation, writing, publication and dissemination of **Strand C** results	2019

1. A country profile for Educational Prosperity

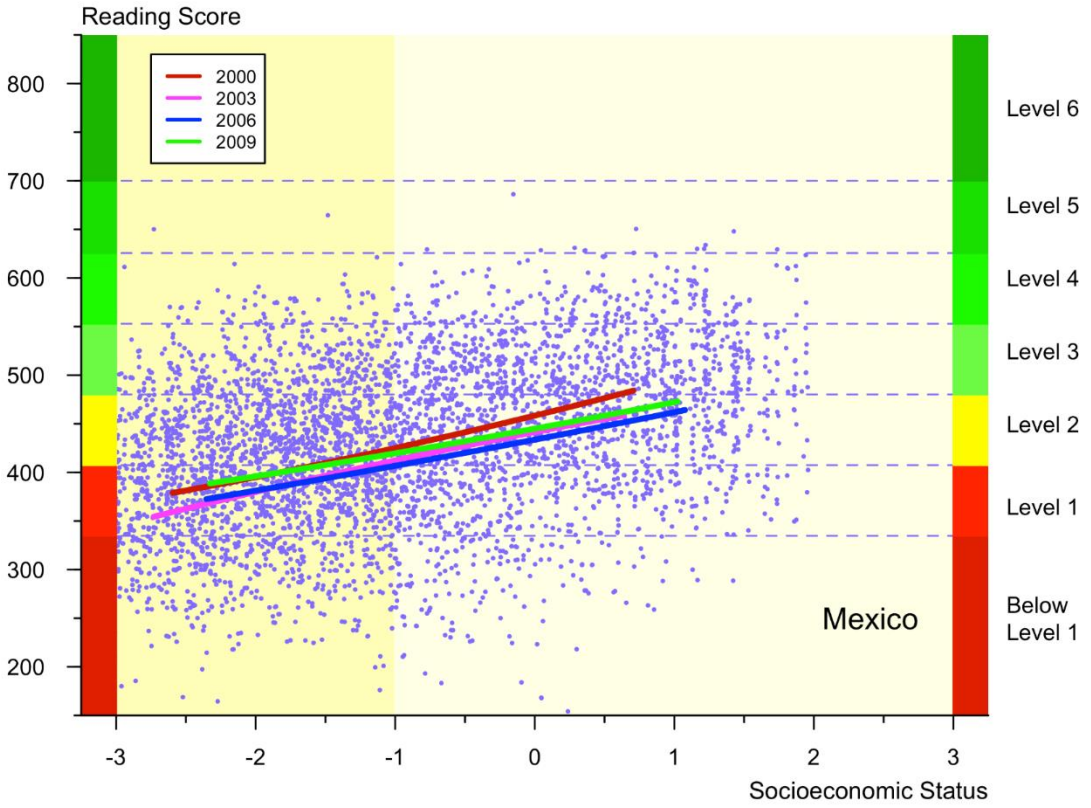
The aim of national and local educational policy is to improve levels of performance for all students while reducing the prevalence of vulnerability and inequalities associated with socioeconomic status.

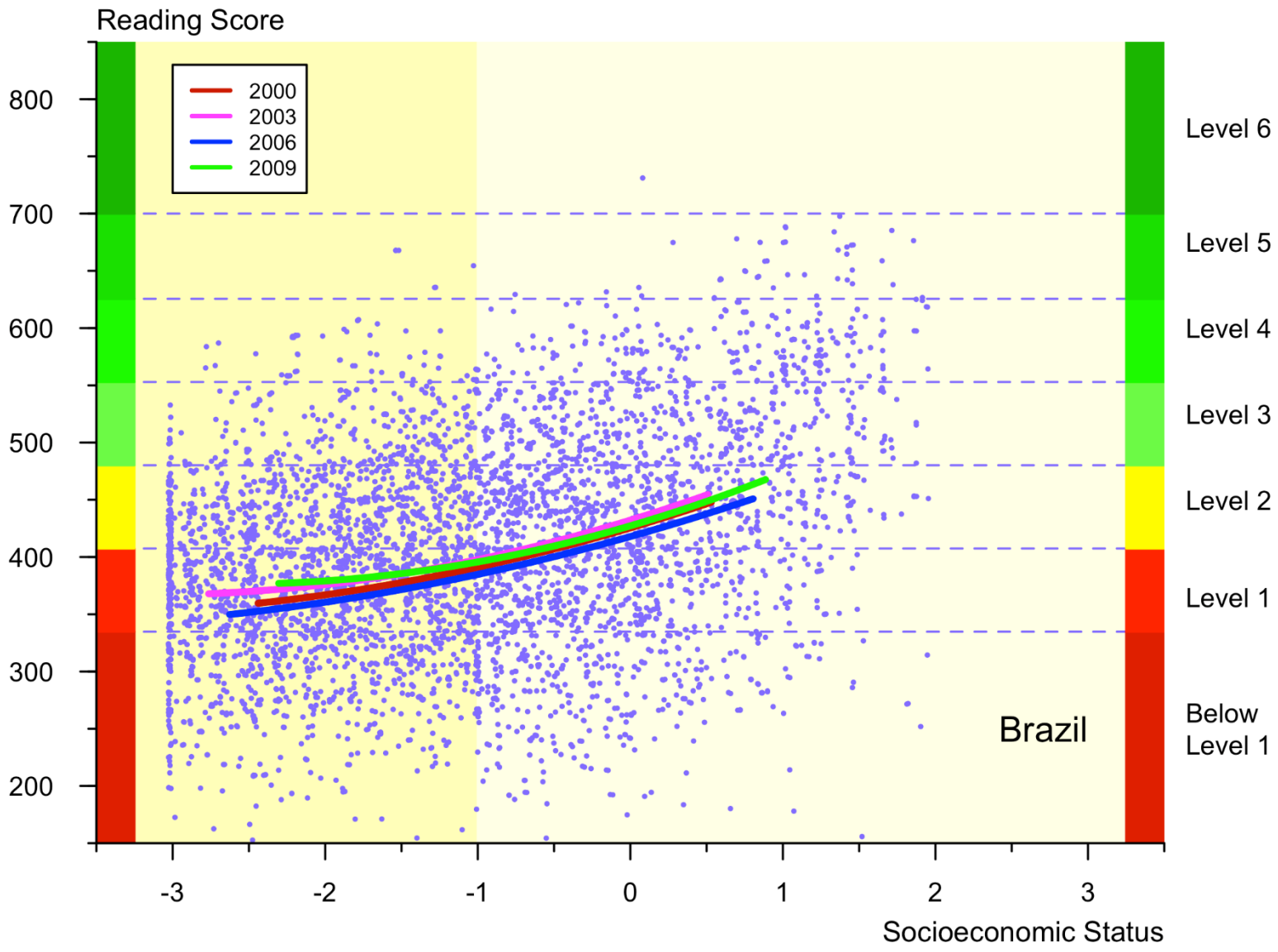
SES gradients as indicators of equality and equity

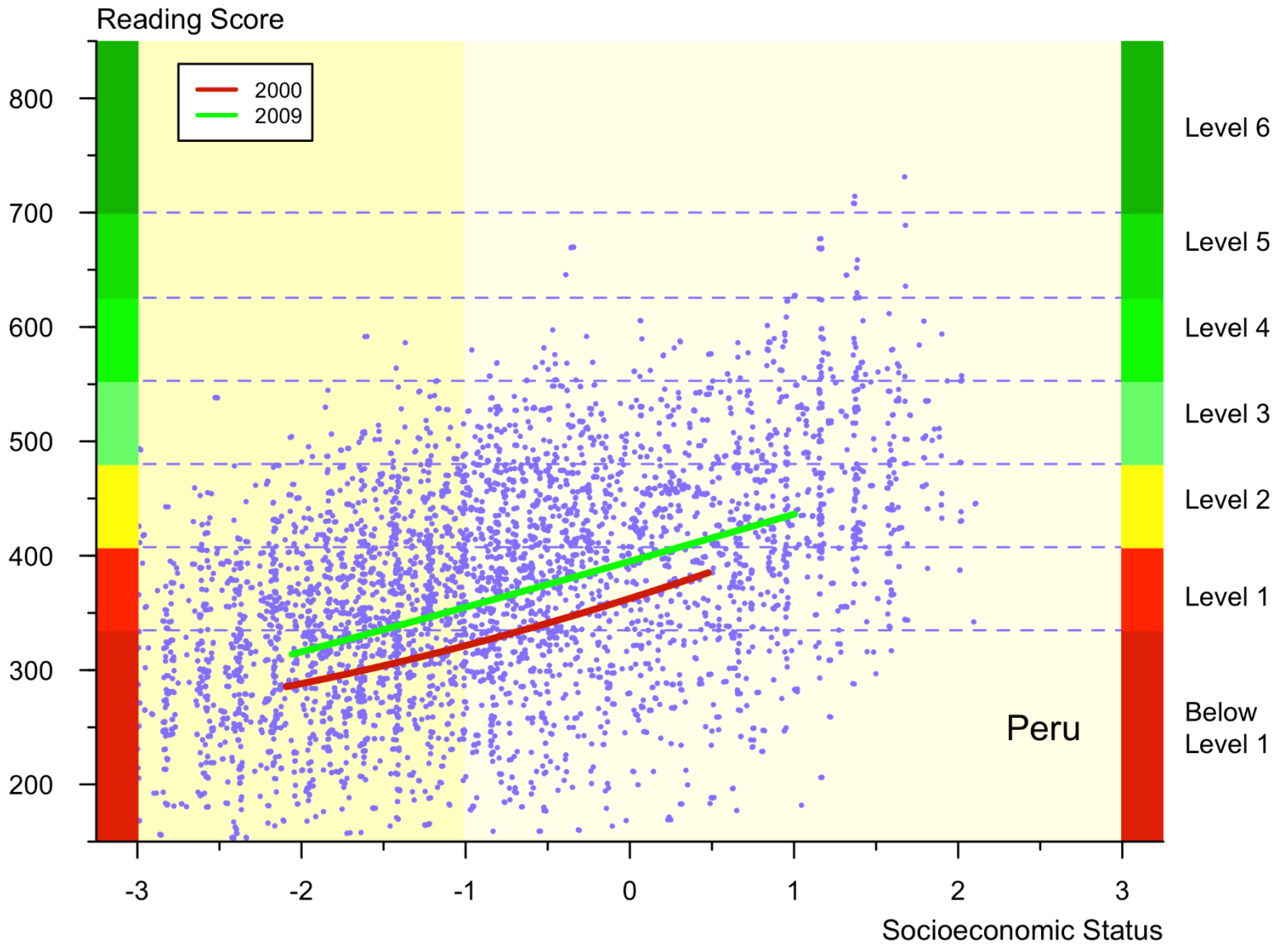
A socioeconomic gradient, or 'learning bar,' simply describes the relationship relationship between a prosperity outcome and socioeconomic status for individuals in a specific jurisdiction, such as a school, a community, a province or state, or a country (Willms, 2003a; 2006). Gradients are useful as they show the level of performance, the relationship with SES, and the full distribution of the prosperity outcome or foundation factor.

This graph shows for Mexico the relationship between reading scores and SES for 2000, 2003, 2006, and 2009.

For Educational Prosperity we would show gradients for each Prosperity Outcome and each Foundation for Success. The graphs can also show gradients for separate sub-populations, such as students from different ethnic groups.




Reading Score
800
700
600
500
400
300
200
2000
2003
2006
2009
Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Below Level 1
Brazil
-3
-2
-1
0
1
2
3
Socioeconomic Status


Reading Score
2000
2009
800
700
600
500
400
300
200
Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Below Level 1
Peru
-3
-2
-1
0
1
2
3
Socioeconomic Status

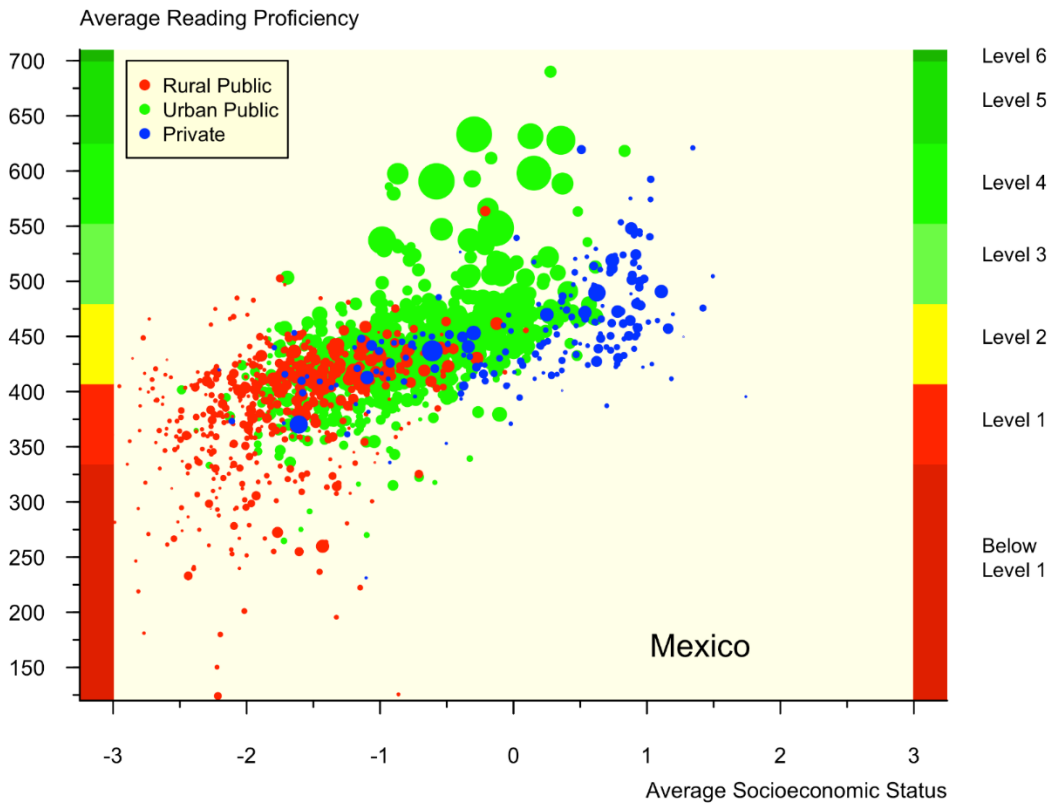
School profiles as indicators of equality and equity

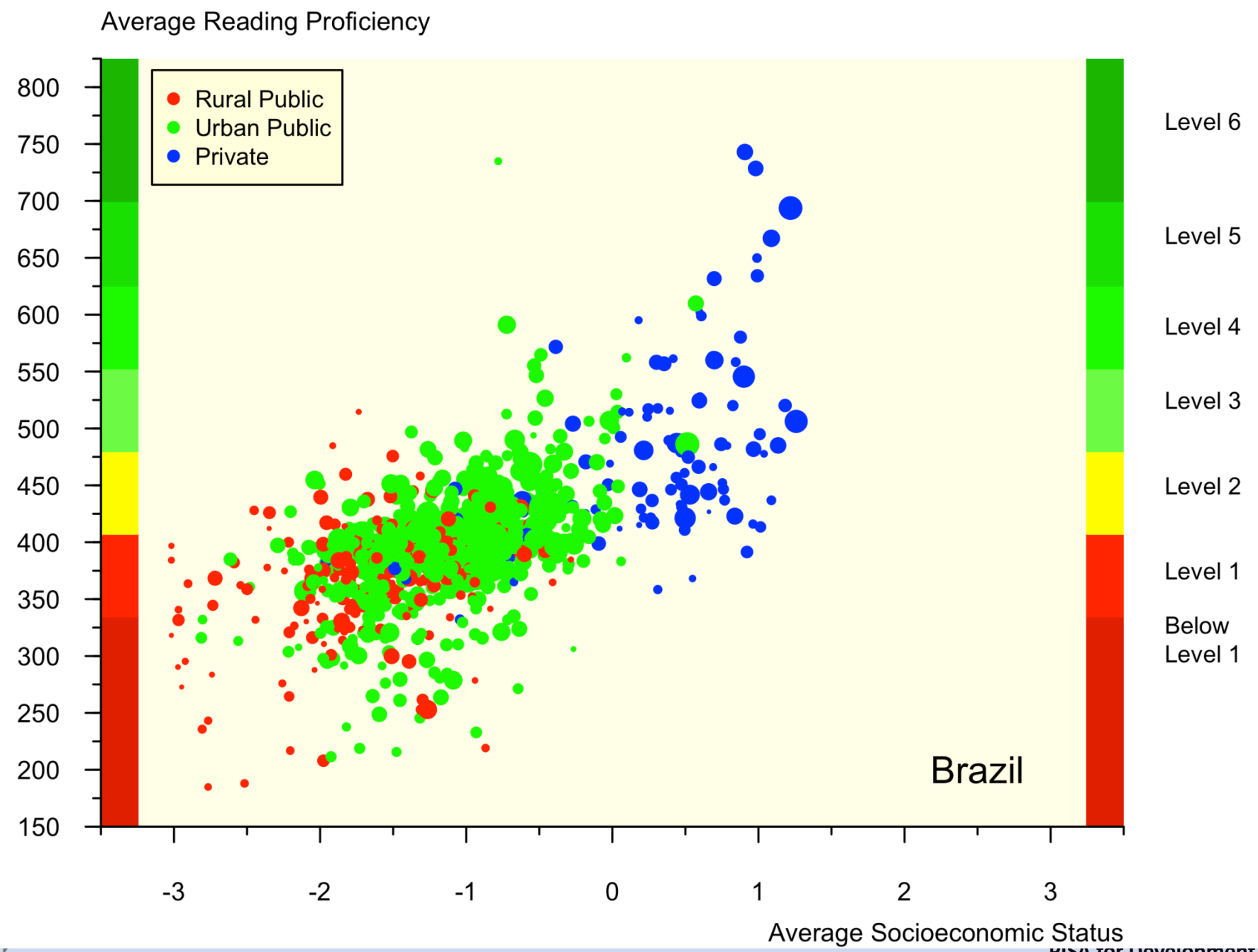
School profiles are another useful tool for the analysis of Educational Prosperity data.

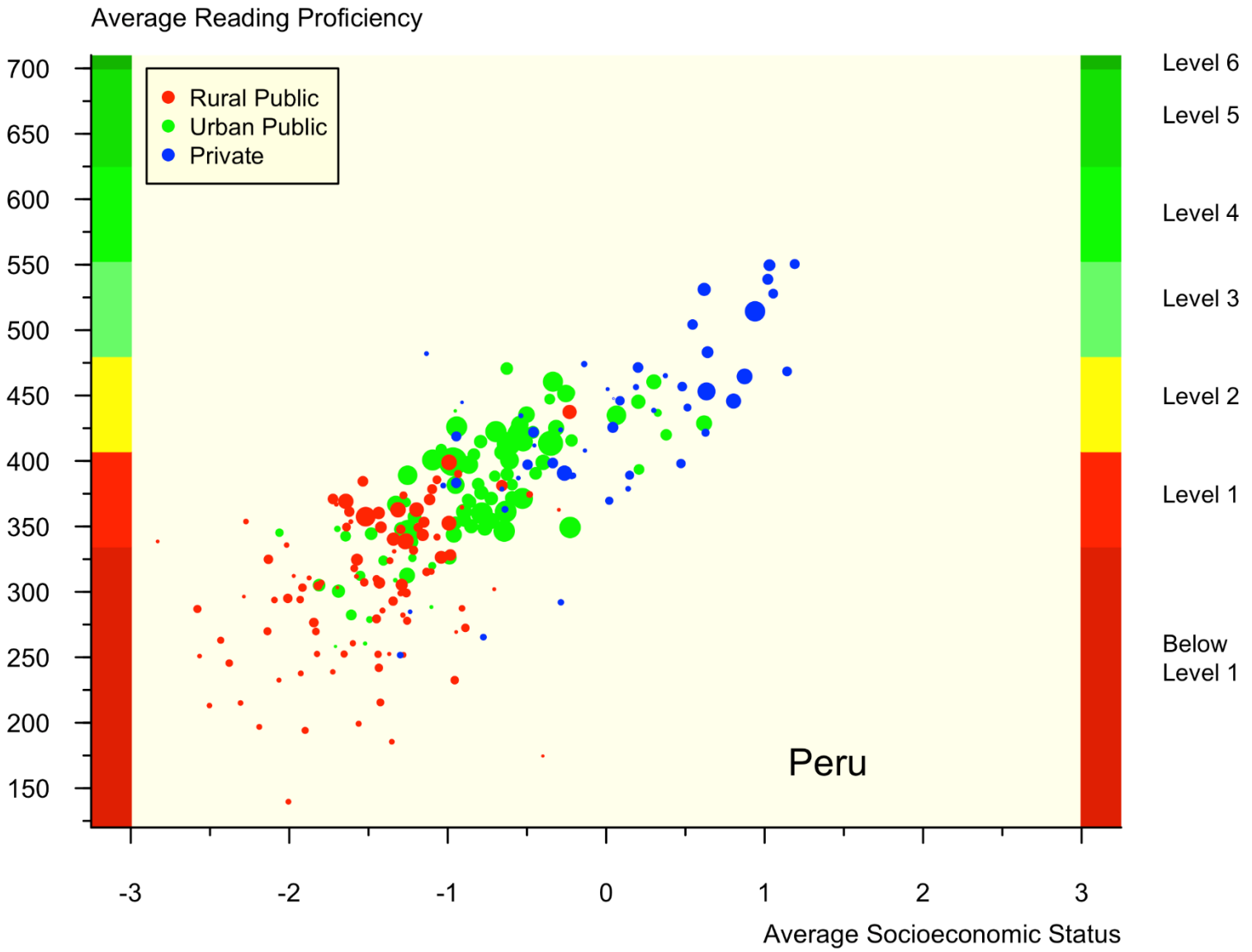
This figure depicts average levels of school reading performance for Mexico plotted against the average levels of socioeconomic status.

Each symbol represents one of the schools that participated in PISA. The shape and colour of the symbols denote whether they are rural schools (red circles), urban public schools (green circles), or private schools (blue circles). The relative size of the symbols corresponds to the square root of the school's total enrollment.

In this case the school profile shows that there is considerable overlap between the urban public and private schools, and relatively small differences in the average performance between the two sectors.

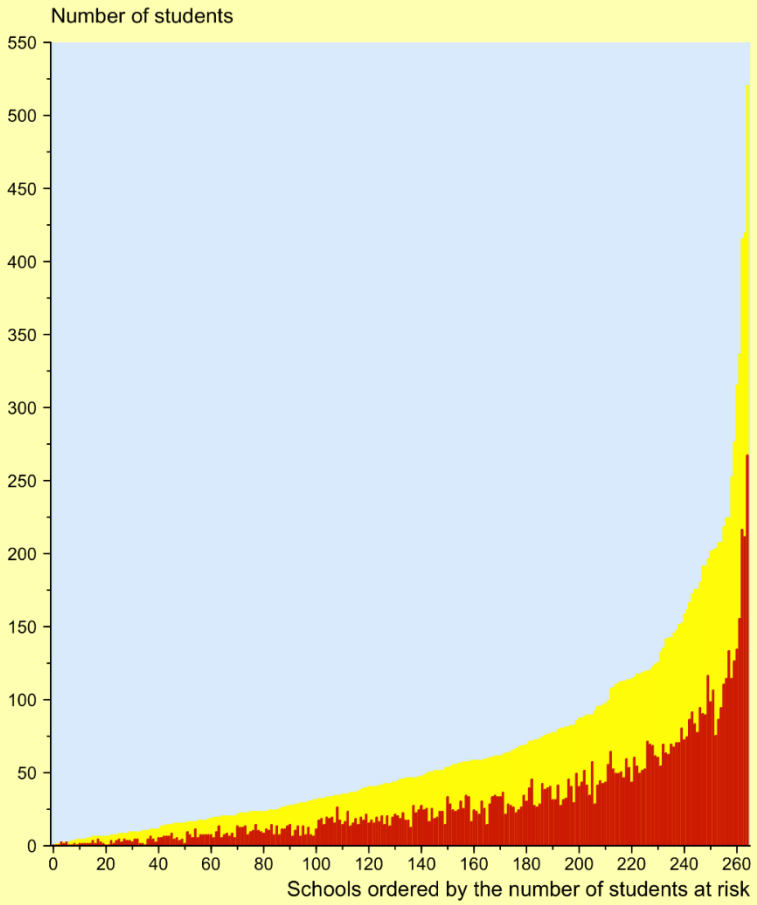



Average Reading Proficiency
Rural Public
Urban Public
Private
800
750
700
650
600
550
500
450
400
350
300
250
200
150
Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Below Level 1
Brazil
-3
-2
-1
0
1
2
3
Average Socioeconomic Status


Average Reading Proficiency
700
650
600
550
500
450
400
350
300
250
200
150
Rural Public
Urban Public
Private
Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Below Level 1
Peru
-3
-2
-1
0
1
2
3
Average Socioeconomic Status

The distribution of vulnerable children among schools

- We would also set out a definition of vulnerable schools, such as those with at least 50% of its students who are vulnerable.
- We also want to know how vulnerable students are distributed among schools.
- The Lorenz curve is a graphical device that is usually used to describe inequalities in income or wealth. For PISA-D, we would plot the cumulative percentage of vulnerable students (Y-axis) against the cumulative proportion of schools, ranked by the prevalence of vulnerable students.
- This graph shows the number of students at moderate and severe risk (yellow and red bars, respectively) for all schools in a jurisdiction. For this school year, the Lorenz curve analysis indicated that “over one-half of the students at risk of dropping out are in about 20% of the province’s schools” (Willms, 2012). These schools can then be targeted for whole-school interventions.

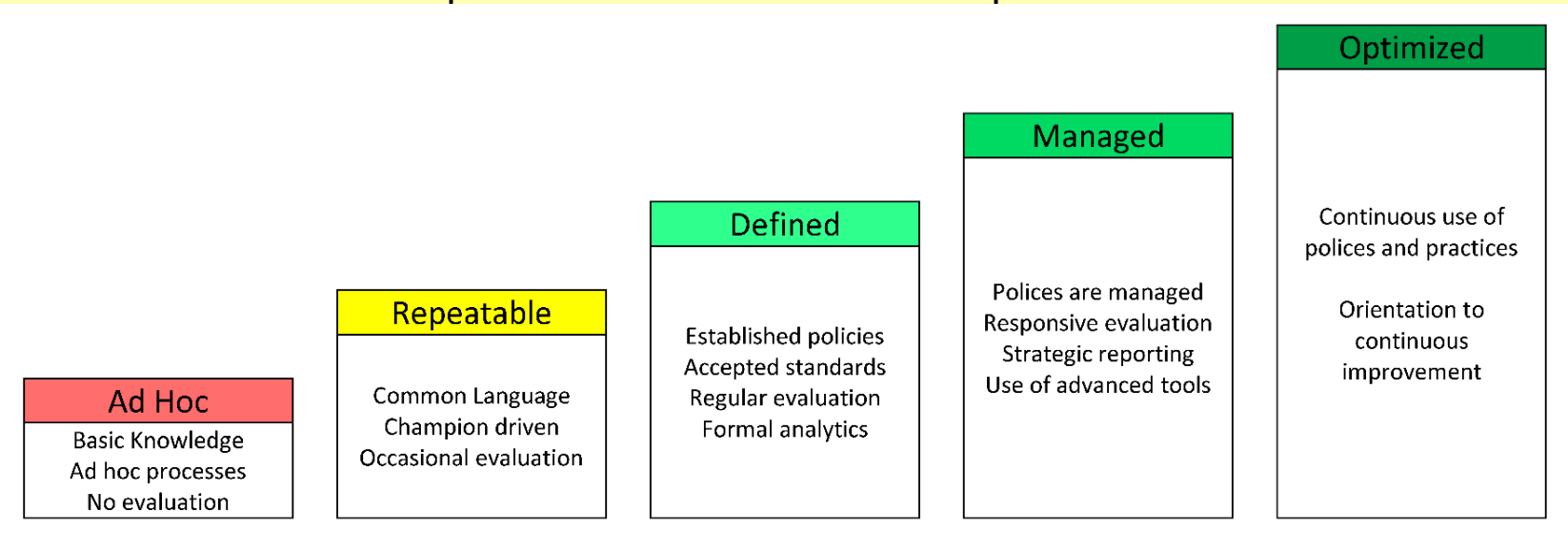


Capability Maturity Models

Outcome and resources maps

The next step will be to develop ***capability maturity models*** for each foundation. Capability maturity models were developed for the IT industry to assess the capability of software contractors to implement software projects. Now they are widely used in businesses to assess the maturity of their business processes; for example, there are financial maturity models and models to assess the maturity of various workflow processes.

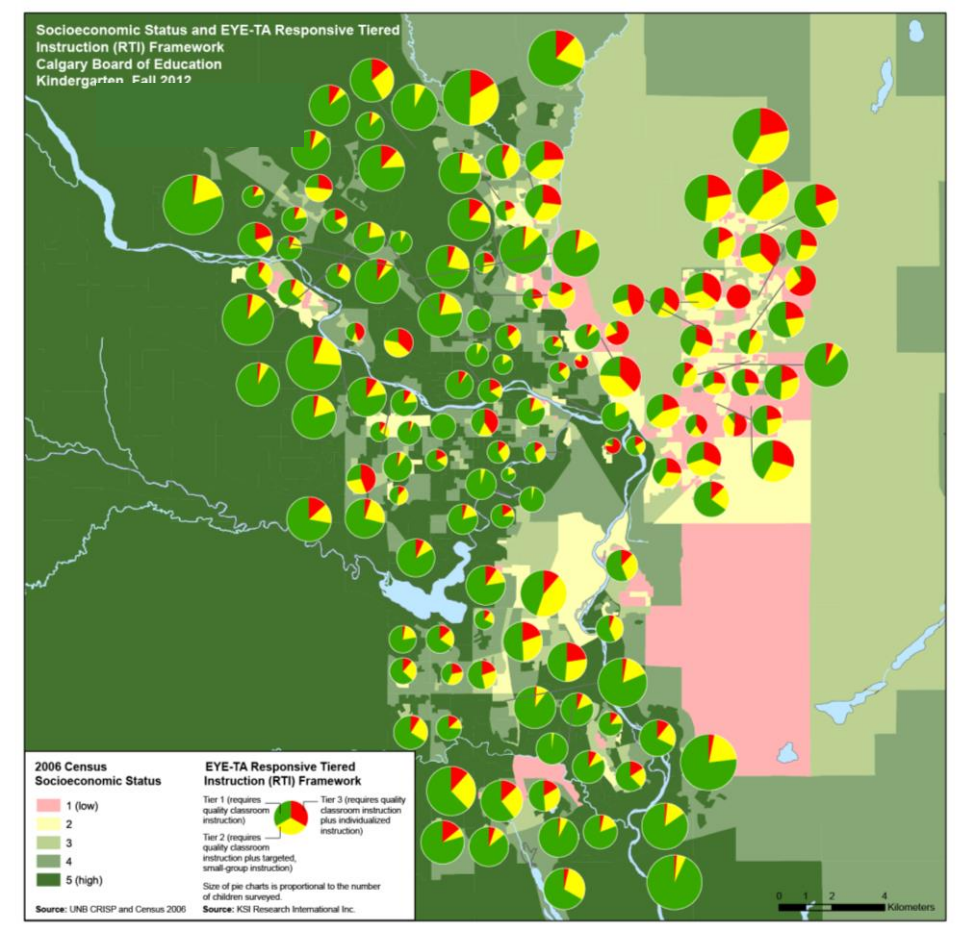
Their goal is to provide a sequential step-by-step roadmap for building a solid foundation for the company. Generally, the models begin by identifying what step or stage a company is at, describe the challenges faced in moving to the next step, and provide guidance on the processes that need to be in place to move to the next step.



The geographic distribution of vulnerable children

Outcome and resources maps

- In most large cities, vulnerability is concentrated in a certain neighbourhoods. Outcome and resource maps show the distributions of outcomes and resources among neighbourhoods or between urban and rural areas.
- In some jurisdictions, the Foundations for Success are unevenly distributed among schools, usually with fewer resources in low SES neighbourhoods of large cities and in rural schools.
- This map shows the distribution of student's pre-literacy scores in one large Canadian city.



Indices of segregation or inclusion

Vertical inclusion is the proportion of variance in reading performance within schools. School systems with relatively less variation in performance *between* schools, and relatively more variation within schools, are vertically inclusive."

"School systems that allocate students into different types of schools based on their ability tend to have low levels of vertical inclusion".

Horizontal inclusion "is the proportion of variance in socio-economic background within schools. It indicates how evenly students from different backgrounds are distributed across schools."

"School systems in cities in which residents are separated into poor or wealthy residential areas tend to have low levels of inclusion on this measure."

Table D6.2. **Index of social inclusion (PISA 2009)**

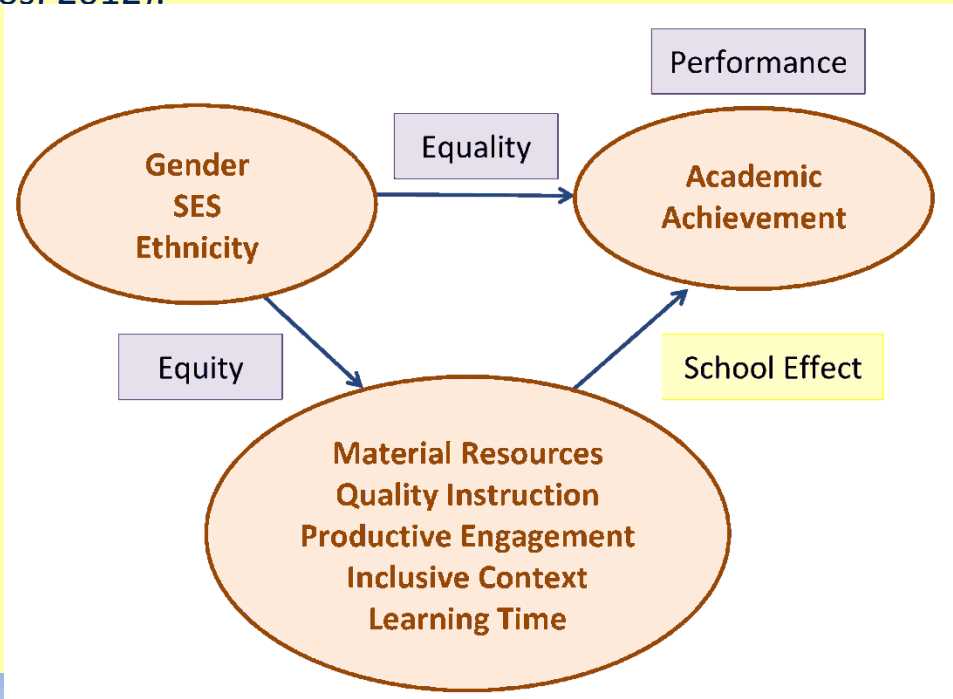
Results based on students' performance and self-reports

		Index of vertical inclusion[1]	Index of horizontal inclusion[2]
		Proportion of student performance variance within schools	Proportion of variance in the *PISA index of social, economic and cultural status of students* (ESCS) within schools
		(1)	(2)
OECD	Australia	73.9	76.4
	Austria	44.4	69.2
	Belgium	47.5	69.8
	Canada	78.3	82.4
	Chile	45.0	48.6
	Czech Republic	51.0	75.1
	Denmark	84.1	83.6
	Estonia	78.2	81.5
	Finland	91.3	89.2
	France	w	w
	Germany	39.8	76.0
	Greece	53.9	68.0
	Hungary	33.3	54.2
	Iceland	85.9	82.8
	Ireland	71.3	76.7
	Israel	51.4	76.7
	Italy	37.9	73.9
	Japan	51.4	78.2
	Korea	65.8	74.1
	Luxembourg	56.4	73.3
	Mexico	51.9	56.2
	Netherlands	35.4	76.2
	New Zealand	75.8	78.9
	Norway	89.7	91.2
	Poland	81.2	73.3
	Portugal	66.9	73.2
	Slovak Republic	60.4	76.6
	Slovenia	42.8	75.0
	Spain	78.2	77.1
	Sweden	81.5	85.7
	Switzerland	67.4	85.4
	Turkey	33.2	63.5
	United Kingdom	70.7	81.6
	United States	64.0	70.7
	OECD average	61.4	74.8
Other G20	Argentina	39.5	59.8
	Brazil	51.6	64.7
	Indonesia	56.8	61.3
	Russian Federation	74.8	71.5
	Shanghai-China	61.6	66.3

Indices of equality and equity

Willms (2011) argued in a contribution for the OECD's 2011 *Education at a Glance* (OECD, 2011), that equality and equity should be defined as separate concepts and measured with a consistent approach, with equality referring to differences among sub-populations in the distribution of their educational outcomes and equity referring to differences among sub-populations in their access to the resources and schooling processes that affect schooling outcomes.

This distinction can be characterized with a path model, as shown below modified from Willms, Tramonte, Duarte, and Bos. 2012).



Indices of equality and equity: Relative Risk

Relative Risk as measures of equality and equity

An indicator of equality that can be easily calculated with standard software is 'relative risk', which is simply the ratio of the prevalence of vulnerability (e.g., PISA scores at or below Level 2) in the 'at-risk' sub-population (e.g., students living in poverty) to the prevalence in the sub-population not at risk (e.g., students not living in poverty).

The table shows for a Canadian jurisdiction the relative risk for four sub-populations having low scores on a set of prosperity outcomes. The results suggest, for example, that elementary-level FNMI (First Nations, Metis and Inuit) students have comparable levels of interest in their school subjects, but are 1.68 times as likely to exert effort compared with their non-FNMI peers.

	Grades 4 to 6			
	Male	**Low SES**	**FNMI**	**Immigrant**
Educational Attainment				
Does not value schooling outcomes	**1.92**	**2.13**	**1.43**	0.84
No aspirations for post-secondary	--	--	--	--
Health and Well-being				
Low physical activity	**0.92**	**1.67**	**1.25**	**1.37**
Poor student behaviour	**2.42**	**1.62**	**2.17**	0.95
Anxiety	**0.71**	**1.37**	**1.55**	1.01
Depression	--	--	--	--
Low self esteem	--	--	--	--
Engagement				
Low interest	**1.53**	**1.61**	1.03	**0.66**
Low effort	**1.71**	**2.24**	**1.68**	0.85