

# Learning *For* or Learning *From* PISA? A Training Course in Functional Literacy

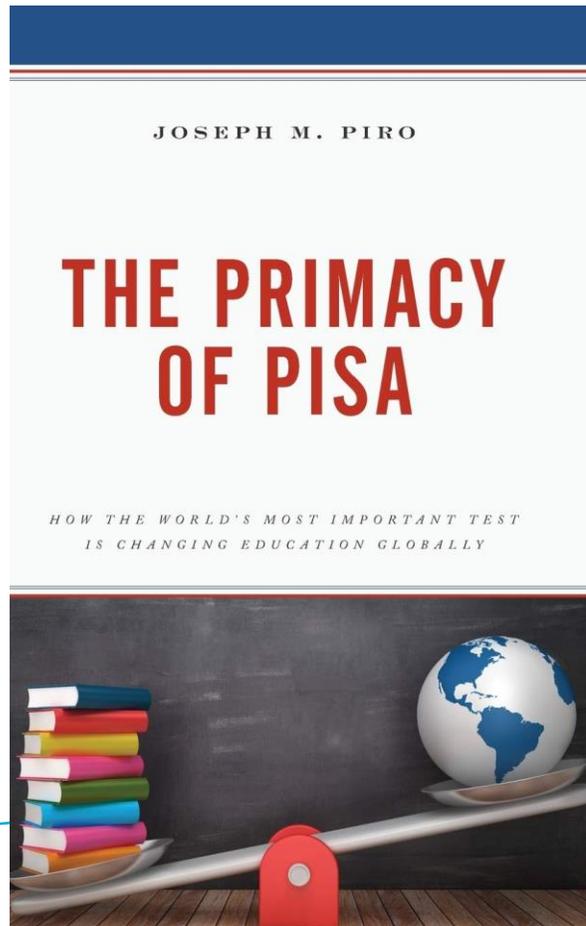


XI NIS Conference  
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Nico Dieteren  
Cito, the Netherlands

# Where it started: Astana, January 2018

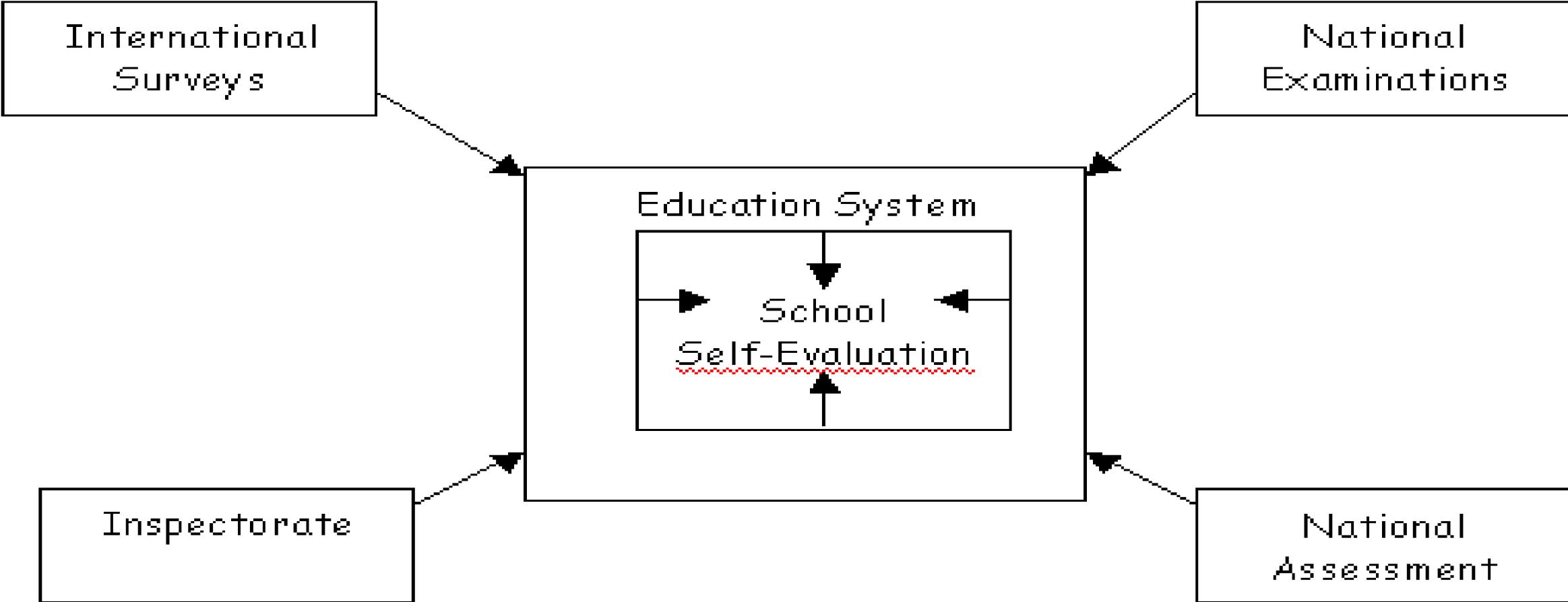


# Do we like PISA or why do like PISA?



- “Can competencies assessed by PISA be considered the fundamental school knowledge 15-year-olds should possess?”
- Etienne Albiser, OECD: keynote on the first ICEME Conference (China, November 2010)

# Do we like PISA or why do like PISA?

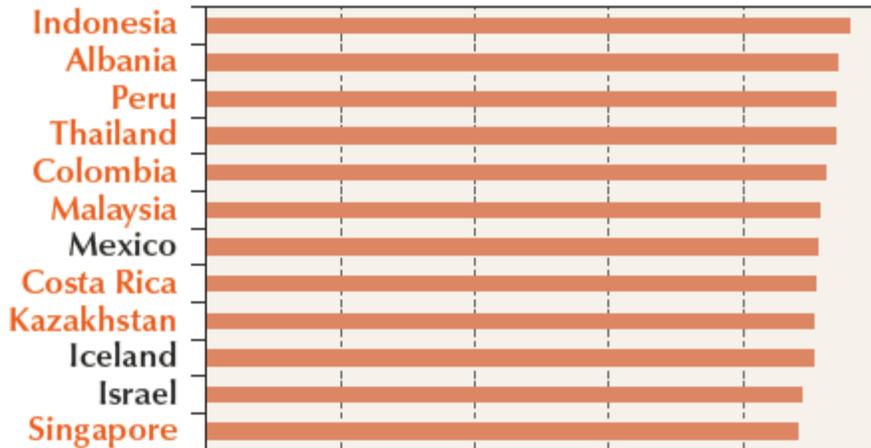


# Kazakhstan and PISA results

	Math	Reading	Science
2009	405 (496)	390 (493)	400 (501)
2012	432 (494)	393 (496)	425 (501)
2015*	460 (493)	427 (490)	456 (493)
2015 – NIS**	523	492	517
2018***	...	...	...
<ul style="list-style-type: none"> <li>• Between (...): OECD averages</li> <li>• * Data 2015 only based on closed items automated scoring; no reliable comparison allowed with previous data (2009 and 2012)</li> <li>• ** 37% of NIS candidates in grade 11</li> <li>• *** official data to be expected in December 2019</li> </ul>			

# Do PISA rankings make Kazakhstan happy?

## Percentage of students who reported being happy at school



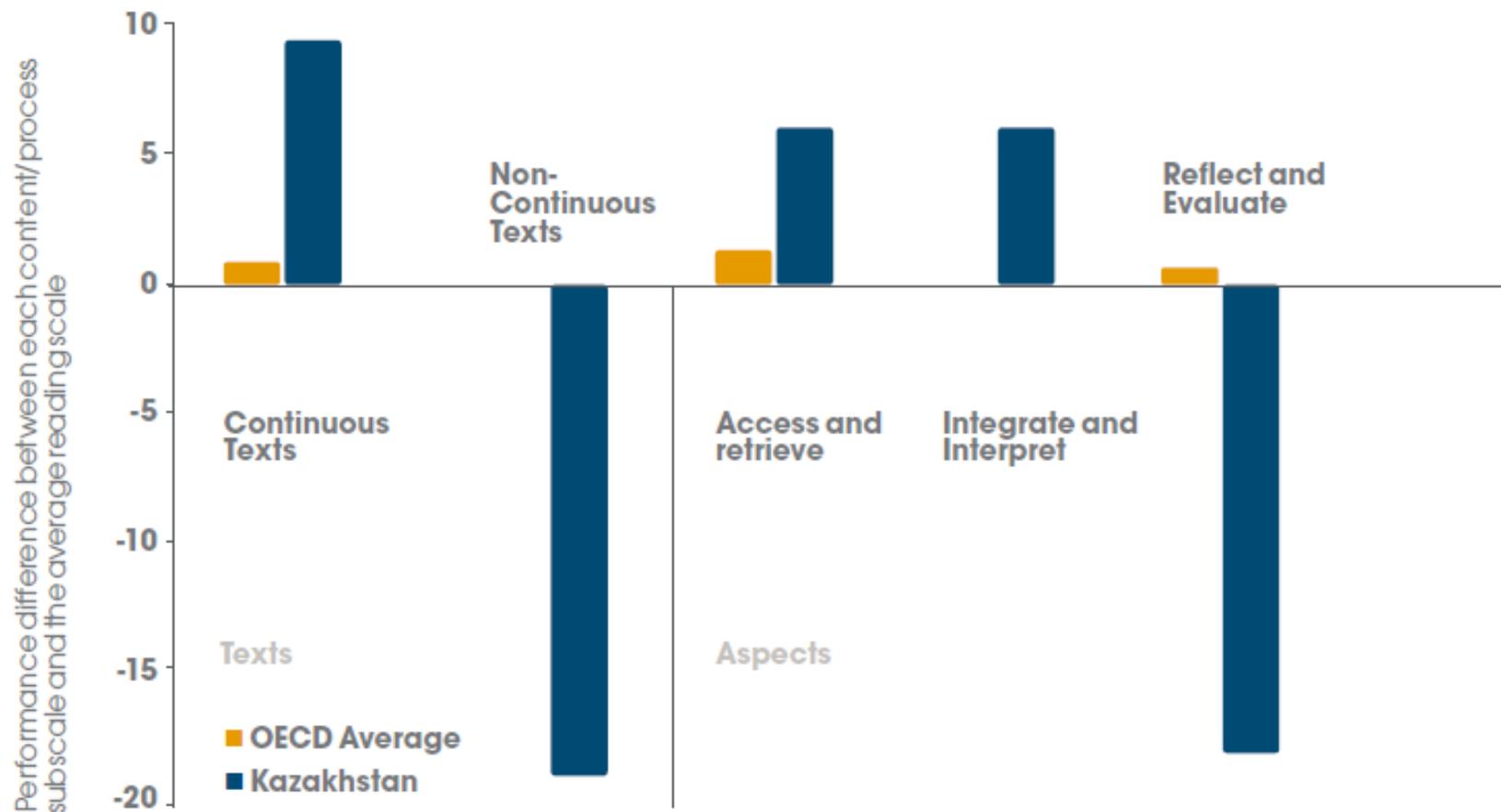
PISA 2012 Questionnaires

OECD average : 80%

Kazakhstan : 90% rank 9

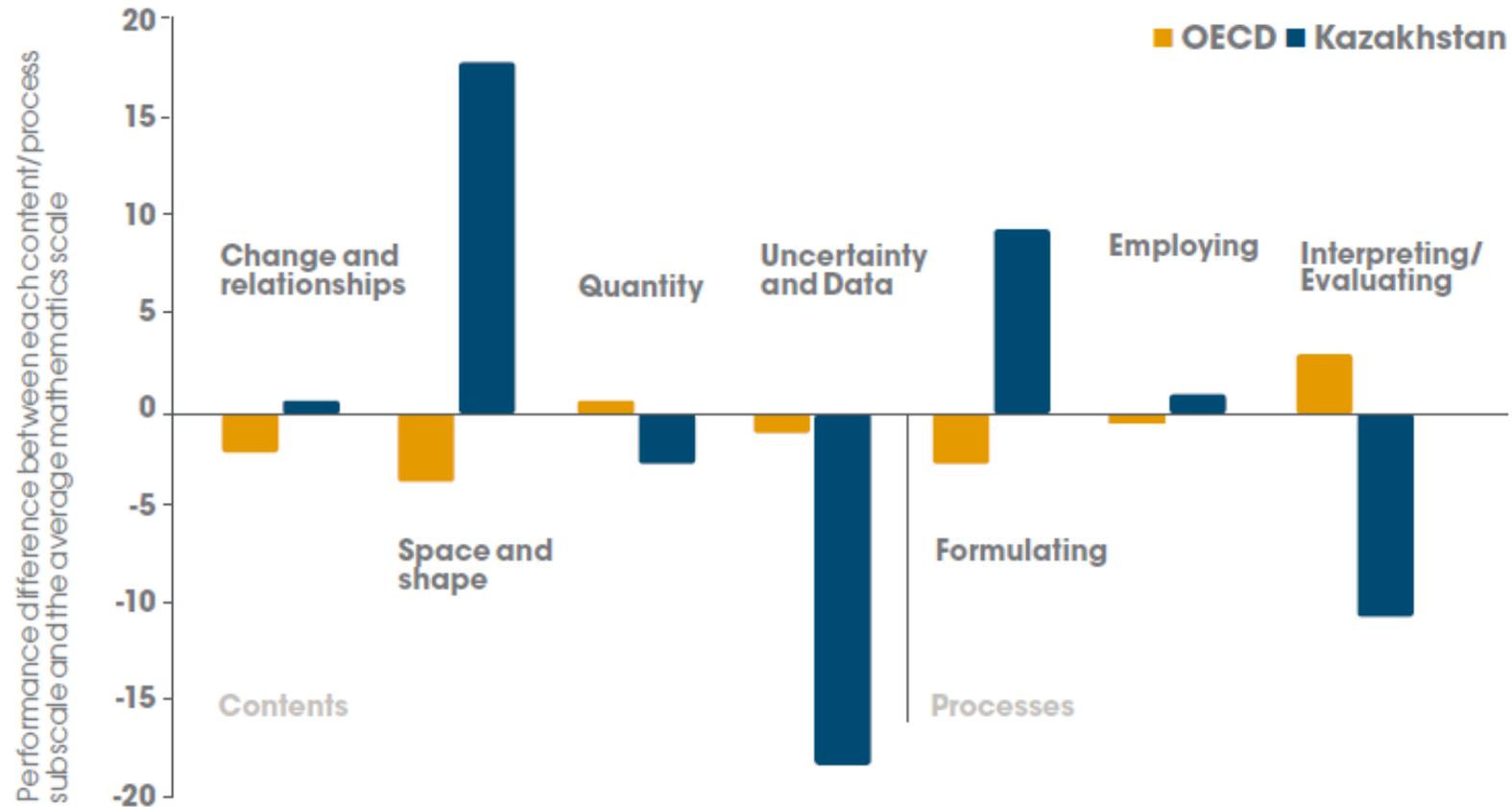
# What Kazakhstan can learn from PISA results: reading 2012

**Figure 18** Kazakhstan's PISA 2012 performance on different reading subscales compared to the average reading performance



# What Kazakhstan can learn from PISA results: math 2012

**Figure 17** Kazakhstan's PISA 2012 performance on different math subscales compared to the average math performance



Source: PISA 2012.



# Towards 'functional literacy': PISA definitions

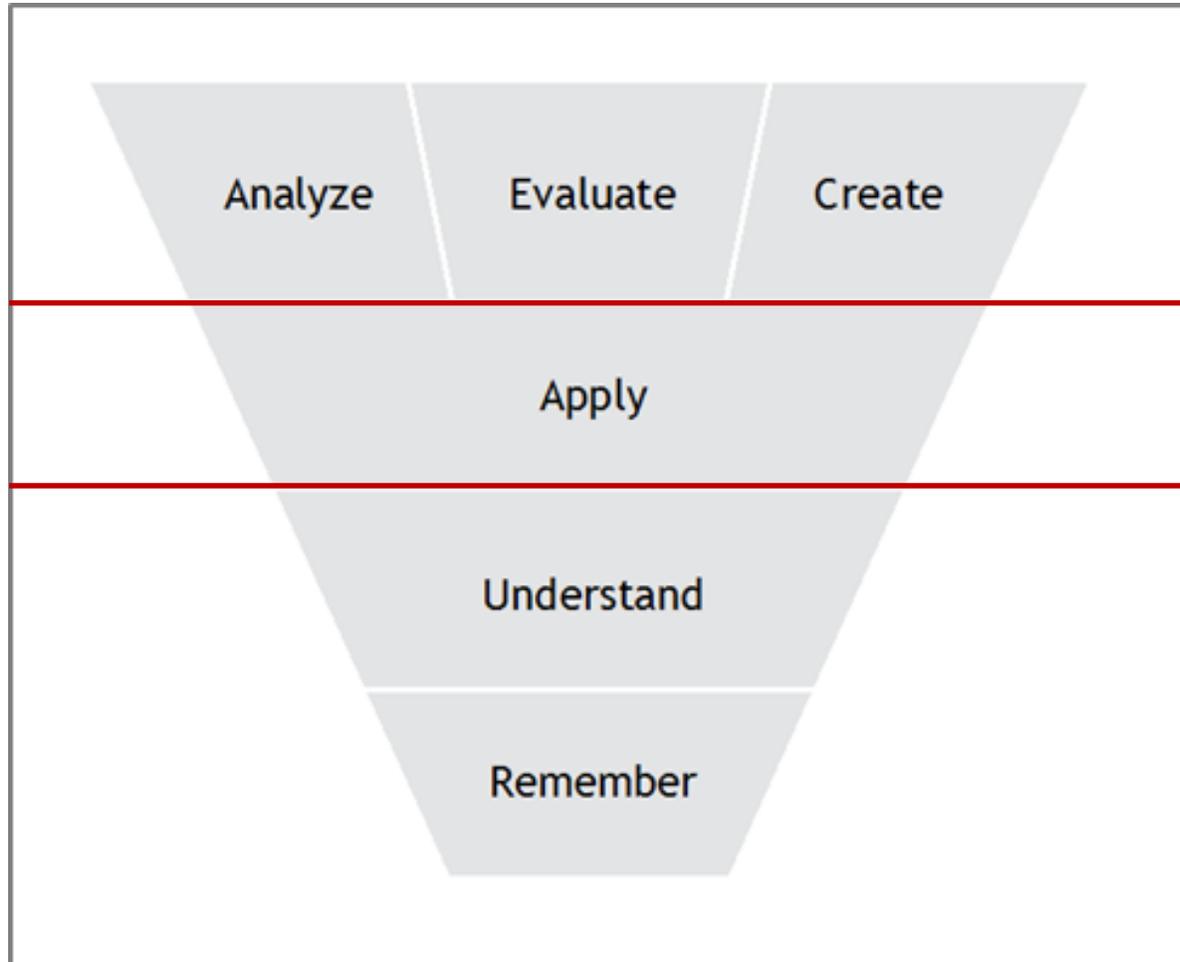
How far students near the end of compulsory education have acquired some of the knowledge and skills that are essential for full participation in society.

*Ability to use language, numbers, images, computers and other basic means to understand, communicate and gain useful knowledge and use the dominant symbol systems of a culture.*

# Higher order thinking skills : many definitions

- “productive behavior” (Maier, 1937)
- “applying factual and conceptual knowledge” (Bloom, 1956)
- “students are challenged to interpret, analyse or manipulate information” (Newman, 1990)
- “critical thinking” (Scriven, Paul, 1992 / e.a.)

# HOTS in a taxonomy : what is high?



# HOTS : our definition

Higher order thinking occurs when a person takes **new** information and information **stored in memory** and **interrelates** and/or rearranges and extends this information **to achieve** a purpose or find answers in perplexing **situations**.

(Lewis and Smith, 1993)

→ situations → contexts → assessment in contexts

# Assessment in contexts

- “Assessing knowledge and skills in real world contexts”
- Depending on the format of assessment – paper, computer, simulator, practice – real world context will be more or less modeled
- *Not to be confused with assessment **of** contexts (contextual questionnaires / TIMMS, PISA, e.a.)*

# Literacy

Knowledge about the subject  
in real life

- Concepts important in real life
- Meaningfull operations
- Procedures needed as a citizen
  
- Assignments in **context of the society**

# Subject (content)

Knowledge to be used in the subject

- Specific concepts
- Specialised operations
- Procedures needed in the subject
  
- Assignments in the **context of the subject**

# Example : assessing literacy in context

PISA 2015 example item for mathematical literacy

## **ROCK CONCERT**

For a rock concert a rectangular field of size 100 m by 50 m was reserved for the audience. The concert was completely sold out and the field was full with all the fans standing.

*Which one of the following is likely to be the best estimate of the total number of people attending the concert?*

*A 2 000*

*B 5 000*

*C 20 000*

*D 50 000*

*E 1000 000*



# Example : assessing literacy in context

PISA 2015 example item for mathematical literacy

## ROCK CONCERT

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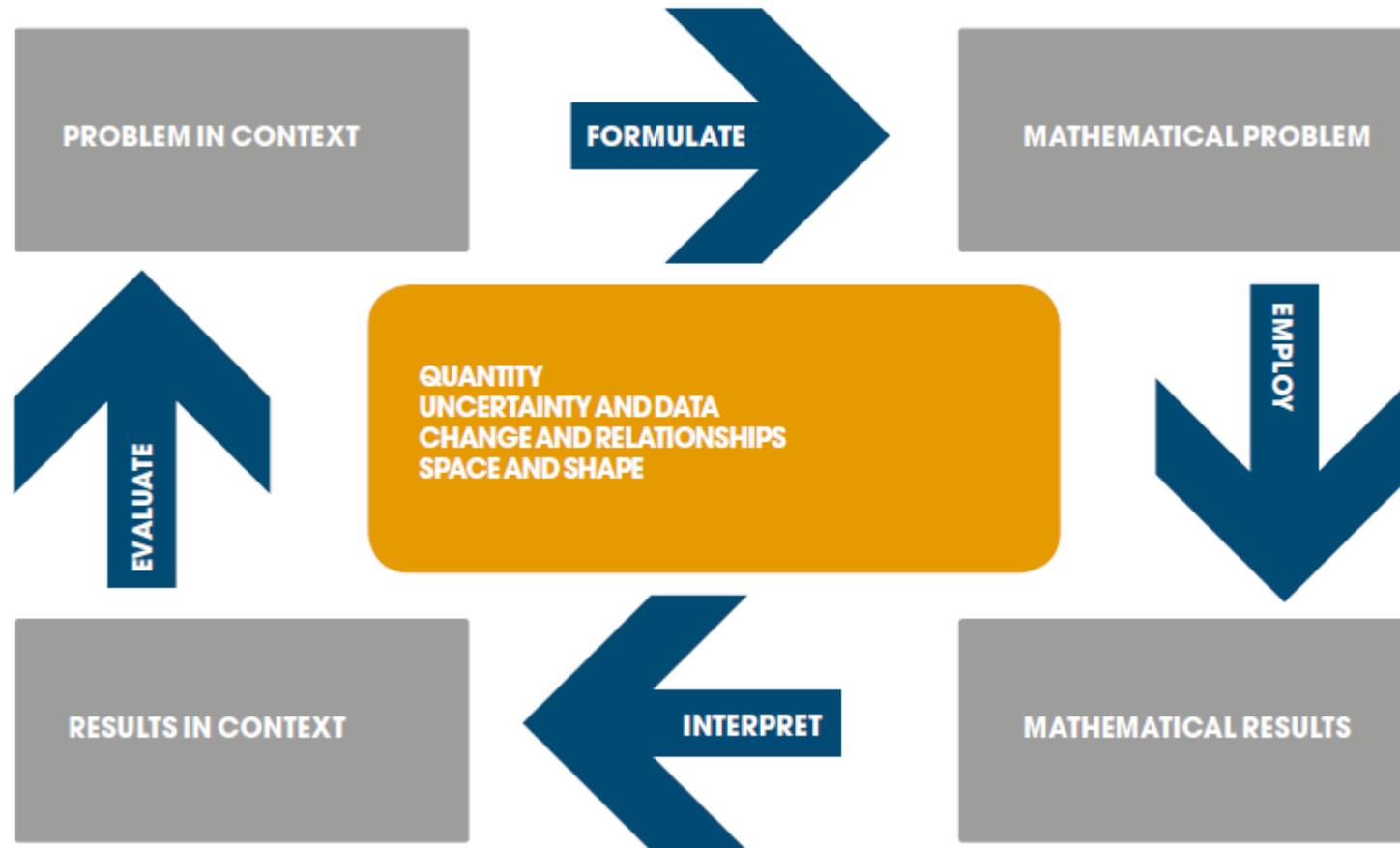
C 20 000

D 50 000

E 1000 000



# Assessment model mathematical literacy



Source: OECD 2014.

# Scientific Literacy Framework

## Contexts

- Personal
- Local/national
- Global

## Competencies

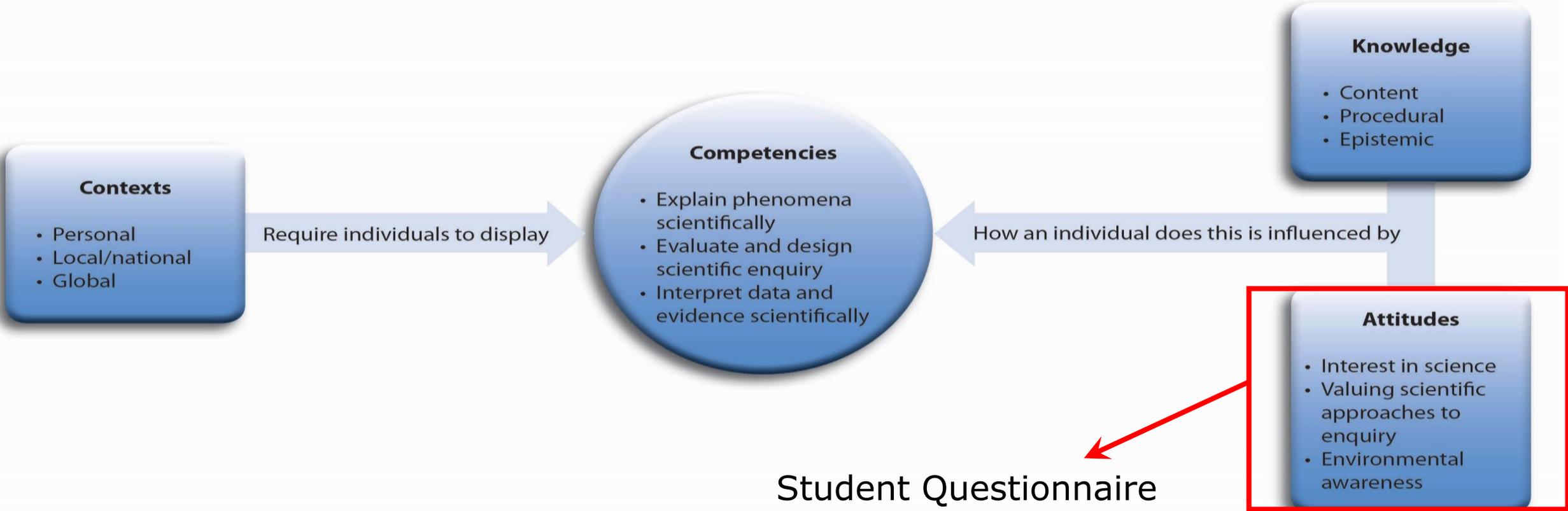
Explain phenomena scientifically  
Evaluate and design scientific enquiry  
Interpret data and evidence scientifically

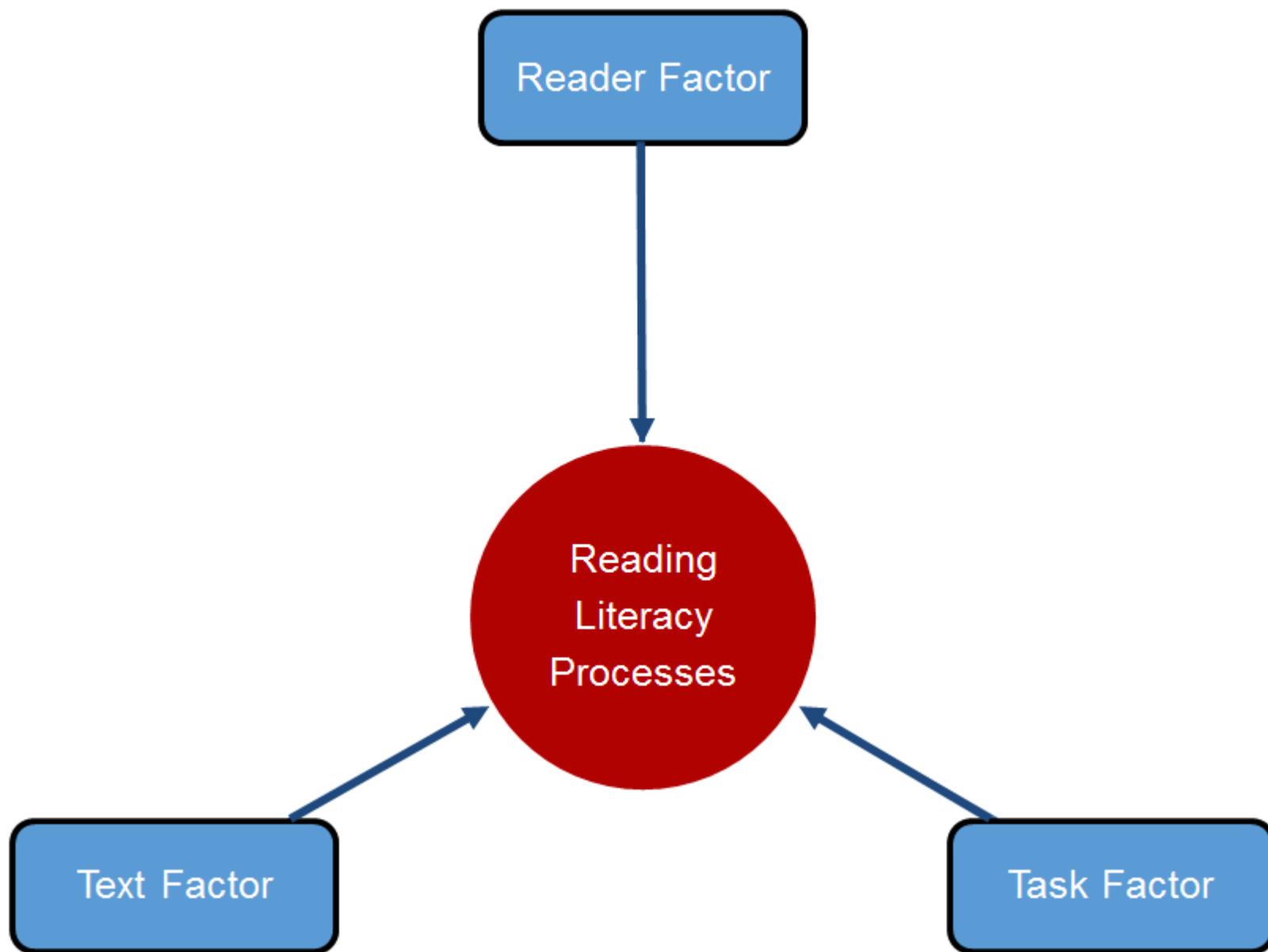
## Knowledge

## Attitudes

- Interest in science
- Valuing scientific approaches to enquiry
- Environmental awareness

# Scientific Literacy Framework





## Text processing

Read fluently

### Locate information

- Access and retrieve information within a text
- Search and select relevant text

### Understand

- Represent literal meaning
- Integrate and generate inferences

### Evaluate and reflect

- Assess quality and credibility
- Reflect on content and form
- Detect and handle conflict

## Task Management

Set  
Goals  
and  
Plans

Monitor,  
regulate

# Types of exercises as used in the training course

I – Released literacy items from PISA were given: complete tasks

Participants were asked to classify the (con)text plus questions according the PISA 2015 Frameworks

<b>Reading literacy</b>	<b>Mathematcial literacy</b>	<b>Scientific literacy</b>
Text format	Content area (domain)	Type of knowledge
Text type	Context (situation)	Context: settings
Text domains		Context: applications
Aspects (competencies)	Competency (process)	Competencies

# Example of a context for exercise I

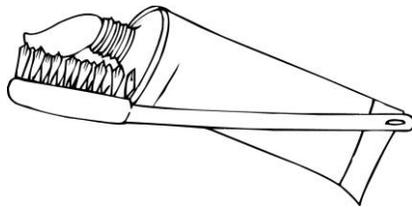
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## TEXT 1 BRUSHING YOUR TEETH

Do our teeth become cleaner and cleaner the longer and harder we brush them?

British researchers say no. They have actually tried out many different alternatives, and ended up with the perfect way to brush your teeth. A two minute brush, without brushing too hard, gives the best result. If you brush hard, you harm your tooth enamel and your gums without loosening food remnants or plaque.

Bente Hansen, an expert on tooth brushing, says that it is a good idea to hold the toothbrush the way you hold a pen. "Start in one corner and brush your way along the whole row," she says. "Don't forget your tongue either! It can actually contain loads of bacteria that may cause bad breath."



*"Brushing your Teeth" is an article from a Norwegian magazine.*

*Use "Brushing Your Teeth" above to answer the questions that follow.*

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## Question 1: BRUSHING YOUR TEETH

F

What is this article about?

- A The best way to brush your teeth.
  - B The best kind of toothbrush to use.
  - C The importance of good teeth.
- The way different people brush their teeth.

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## Question 2: BRUSHING YOUR TEETH

F

What do the British researchers recommend?

- A That you brush your teeth as often as possible.
- B That you do not try to brush your tongue.
- C That you do not brush your teeth too hard.
- D That you brush your tongue more often than your teeth.

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## Question 3: BRUSHING YOUR TEETH

R403Q03

Why should you brush your tongue, according to Bente Hansen?

.....

# Types of exercises as used in the training course

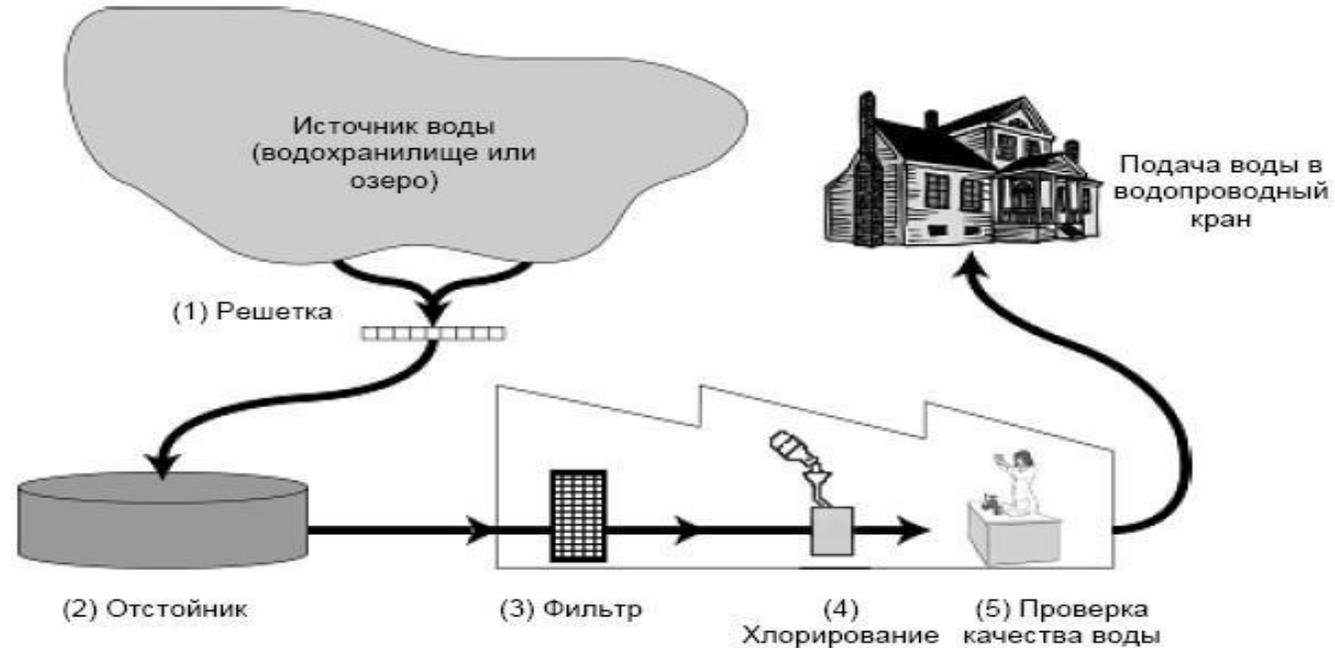
II – Released literacy items from PISA were given: only the (con)text, no questions

- Participants were asked to develop 2 or 3 questions, according the PISA 2015 Frameworks
- Asked to use different levels of competencies according the framework

# Example of a context for exercise II

## ЗАДАНИЕ №17. ПИТЬЕВАЯ ВОДА

На рисунке, приведенном выше, показано, как вода, которая подается в городские дома, становится пригодной для питья.



# Types of exercises as used in the training course

III – Context material was selected and provided by the trainers

- Participants were asked to develop 2 questions with a chosen context, that were fitting the general requirements for assessment of literacy in contexts
- These questions had to be aligned with the PISA 2015 Frameworks
- They were asked to use different levels of competencies according the framework





# Types of exercises as used in the training course

## IV – Context material to be selected by the participants

- Participants were asked to find a context that would be fitting the general requirements for assessment of literacy in contexts
- To check the applicability of that context, by using the checklist for (con)text choice.
- To develop at least 2 relevant questions that demand application of knowledge and skills in relation to one of the PISA domains Reading, Math or Science
- These questions had to be aligned with the PISA 2015 Frameworks
- They were asked to use different levels of competencies according the framework

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