## Umræðufundur um PISA 2009

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# PISA 2009 Results: Students On Line

DIGITAL TECHNOLOGIES AND PERFORMANCE

(VOLUME VI)

- 1. Context of the PISA Digital Reading Assessment
- 2. Student Performance in Digital and Print Reading
- 3. Navigation in the PISA 2009 Digital Reading Assessment
- 4. Relationships between Digital Reading Performance and Student Background, Engagement and Reading Strategies
- 5. Students' Familiarity with Information and Communication Technologies (ICT)
- 6. Students' Use of Information and Communication Technologies and their Performance in Digital Reading

7. Some Aspects Related to Digital Reading Proficiency



### Demo

 <u>http://erasq.acer.edu.au/</u> Username: public
 Password: access

# In most countries, student performance in digital and print reading is closely related.

# Proficient digital readers tend to know how to navigate effectively and efficiently.

- Navigation is a key component of digital reading, as readers "construct" their text through navigation. Thus, navigational choices directly influence what kind of text is eventually processed.
- Stronger readers tend to choose strategies that are suited to the demands of the individual tasks.
- Stronger readers tend to minimise their visits to irrelevant pages and locate necessary pages efficiently.
- Today's 15-year-olds, the "digital natives", do not automatically know how to operate effectively in the digital environment, as has sometimes been claimed.

Students' attitudes towards reading and their socio-economic backgrounds and immigrant status seem to have similar associations with both print and digital reading proficiency.

- On average, the least enthusiastic students are twice as likely to perform poorly in digital reading as the most enthusiastic readers
- This finding holds for both boys and girls.
- Engaging in certain online activities also has an impact on digital reading performance. The more frequently students search for information on line, the better their performance in digital reading.
- Being unfamiliar with online social practices, such as e-mailing and chatting, seems to be associated with low digital reading proficiency; but students who frequently e-mail and chat on line also perform less well than students who are only moderately involved in these activities.



In all participating countries and economies, the gender gap in performance is narrower in digital reading than in print reading.

• Girls outperform boys in digital reading by an average of 24 score points, compared to an average of 39 score points in print reading.

### Access to ICT has grown significantly in recent years

- fewer than 1% of students across OECD countries reported that they had never used a computer
- Between PISA 2000 and 2009 surveys, the percentage of students who reported having at least one computer at home increased from 72% to 94%.
- There was an increase in the computer-student ratio at school between 2000 and 2009 evidence of substantial investment in ICT resources.
- But the proportion of students who reported using a computer at school <u>varies substantially across countries</u> and economies.

Using a computer at home is related to digital reading performance in all 17 participating countries and economies, but that is not always true for computer use at school

- Moderate computer users attain higher scores in digital reading than both rare and intensive users.
- The relationship between students' computer use at school and performance in digital reading tends to be negative with a slight curve, i.e. more intensive use is associated with lower scores.
- After accounting for students' academic abilities, the frequency of computer use at home, particularly for leisure, is positively associated with navigation skills and digital reading performance
- The frequency of computer use at school <u>is not</u>. These findings suggest that students are developing digital reading literacy mainly by using computers at home to pursue their interests.



#### Table VI.A

#### AN OVERVIEW OF PERFORMANCE IN DIGITAL READING, NAVIGATION AND COMPUTER USE

Highe At OE

Higher quality or equity than OECD average

At OECD average (no statistically significant difference)

Lower quality or equity than OECD average

|          |              |                                   |   |  | Cor   | nputer use at he   | ome  | Con   | nputer use at sc   | hool   |
|----------|--------------|-----------------------------------|---|--|---|--|--|---|--|--|
|          |              | Digital<br>reading<br>performance | Gender<br>difference<br>in digital<br>reading scores<br>between boys<br>and girls | Index<br>of number<br>of relevant<br>pages visited<br>(navigation<br>skills) | Percentage<br>of students<br>who use<br>a computer<br>at home | Percentage<br>difference<br>between top<br>and bottom<br>quarters<br>of the PISA<br>index of<br>economic,<br>social and<br>cultural status | Difference<br>in digital<br>reading scores<br>between<br>those students<br>who use and<br>those who<br>do not use a<br>computer<br>at home | Percentage<br>of students<br>who use<br>a computer<br>at school | Percentage<br>difference<br>between top<br>and bottom<br>quarters<br>of the PISA<br>index of<br>economic,<br>social and<br>cultural status | Difference<br>in digital<br>reading scores<br>between<br>those students<br>who use and<br>those who<br>do not use<br>a computer<br>at school |
|          |              | Mean score                        | Score dif.  | Mean index   | %   | % dif.   | Score dif.   | %   | % dif.   | Score dif.   |
|          | OECD average | 499                               | -24   | 46.3   | 92.3  | 16.0   | 80   | 74.2  | 0.3  | 9  |
| 0        | Korea        | 568                               | -18   | 52.8   | 87.5  | 19.5   | 49   | 62.7  | 3.5  | 2.1  |
| BO       | New Zealand  | 537                               | -40   | 49.7   | 92.5  | 20.2   | 90   | 83.4  | 6.4  | 20   |
| <u> </u> | Australia    | 537                               | -28   | 49.6   | 96.7  | 7.8  | 84   | 91.6  | 5.6  | 42   |
| 83       | Japan        | 519                               | -23   | 50.1   | 75.9  | 38.6   | 48   | 59.3  | 2.6  | 14   |
|          | Iceland      | 512                               | -30   | 47.5   | 99.1  | 1.2  | 74   | 79.5  | 5.1  | 22   |
|          | Sweden       | 510                               | -26   | 47.8   | 97.7  | 4.7  | 105  | 89.1  | 4.7  | 28   |
|          | Ireland      | 509                               | -31   | 47.4   | 93.2  | 10.9   | 60   | 62.9  | 0.4  | -3   |
|          | Belgium      | 507                               | -24   | 47.7   | 96.9  | 9  | 102  | 62.8  | -1.1   | 9  |
|          | Norway       | 500                               | -35   | 46.9   | 98.7  | 2.7  | 77   | 93.0  | 2.5  | 25   |
|          | France       | 494                               | -20   | 46.1   | m   | m  | m  | m   | m  | m  |
|          | Denmark      | 489                               | -6  | 47.2   | 98.8  | 2.8  | 79   | 93.0  | 1.8  | 6  |
| 5        | Spain        | 475                               | -19   | 44.2   | 92.6  | 14.4   | 78   | 65.5  | -4.0   | 11   |
|          | Hungary      | 468                               | -21   | 41.6   | 91.8  | 23.6   | 102  | 69.3  | -8.9   | -27  |
| 2        | Poland       | 464                               | -29   | 42.0   | 92.1  | 22.9   | 84   | 60.6  | -9.1   | -8   |
| 6        | Austria      | 459                               | -22   | 43.3   | 98.2  | 3.7  | 94   | 84.1  | -3.2   | -6   |
|          | Chile        | 435                               | -19   | 37.7   | 73.2  | 60.3   | 69   | 56.8  | -2.0   | 2  |

#### Table VI.A

#### AN OVERVIEW OF PERFORMANCE IN DIGITAL READING, NAVIGATION AND COMPUTER USE

Hi At

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Higher quality or equity than OECD average

At OECD average (no statistically significant difference)

Lower quality or equity than OECD average

|          |                 |                                   |   |  | Сог   | nputer use at h  | ome  | Con   | nputer use at sc   | hool   |
|----------|-----------------|-----------------------------------|---|--|---|--|--|---|--|--|
|          |                 | Digital<br>reading<br>performance | Gender<br>difference<br>in digital<br>reading scores<br>between boys<br>and girls | Index<br>of number<br>of relevant<br>pages visited<br>(navigation<br>skills) | Percentage<br>of students<br>who use<br>a computer<br>at home | Percentage<br>difference<br>between top<br>and bottom<br>quarters<br>of the PISA<br>index of<br>economic,<br>social and<br>cultural status | Difference<br>in digital<br>reading scores<br>between<br>those students<br>who use and<br>those who<br>do not use a<br>computer<br>at home | Percentage<br>of students<br>who use<br>a computer<br>at school | Percentage<br>difference<br>between top<br>and bottom<br>quarters<br>of the PISA<br>index of<br>economic,<br>social and<br>cultural status | Difference<br>in digital<br>reading scores<br>between<br>those students<br>who use and<br>those who<br>do not use<br>a computer<br>at school |
|          |                 | Mean score                        | Score dif.  | Mean index   | %   | % dif.   | Score dif.   | %   | % dif.   | Score dif.   |
|          | OECD average    | 499                               | -24   | 46.3   | 92.3  | 16.0   | 80   | 74.2  | 0.3  | 9  |
| ers      | Hong Kong-China | 515                               | -8  | 48.1   | 96.4  | 5.2  | 33   | 82.6  | 0.2  | 3  |
| artn     | Macao-China     | 492                               | -12   | 46.5   | 96.4  | 5.2  | 61   | 80.1  | -1.0   | 4  |
| <b>.</b> | Colombia        | 368                               | -3  | 31.5   | m   | m  | m  | m   | m  | m  |



# 1. Context of the PISA Digital Reading Assessment



## **Paper** → **Screen**

- New technologies for text, new ways of reading
- Differences in the readability and usability of text
- From static pages to dynamic windows and frames
- From linear arrangement to networking and hyperlinking
- From illustrated text to multimedia and augmented reality
- From authored texts to online discussion and social networks

#### Figure VI.1.1

#### **Comparison of print and digital texts**



Search



### Impact of digital texts on reading literacy

- Access to text
  - search phrases
  - heterogeneous links
  - navigation devices
  - integration across texts

- Evaluation of text
  - what the text is about,
  - who wrote it,
  - who published it,
  - when,
  - for what purpose,
  - with what potential biases.

### Some issues for assessing digital reading

- Whether print and digital reading belong to the same construct.
  - Gathering information on the Internet requires skimming and scanning through large amounts of material and immediately evaluating its credibility
  - Critical thinking, therefore, has become more important than ever in reading literacy
  - Explained variance in performance
    - Nonlinearity, navigation behaviour, intertextuality, and uncertainty regarding the quality of information

# Digital natives

- Over the past ten years, there has been a discussion as to whether the people who have been exposed to information technology from a young age, so-called "digital natives", might readily possess the skills and abilities required to make use of digital devices, compared to older people, the so-called "digital immigrants".
- There is mounting evidence that mere exposure to technology is not sufficient for becoming a skilled user.





# Student Performance in Digital and Print Reading

2.



# **Reading literacy**

• PISA defines reading literacy as understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, develop one's knowledge and potential, and participate in society.

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### Figure VI.2.1Digital reading tasks by environment

| Environment   | % of tasks | Sample tasks   |
|---------------|------------|--|
| Authored      | 66%        | <ul> <li>IWANTTOHELP – Task 3</li> <li>SMELL – Tasks 1, 2 and 3</li> <li>JOB SEARCH – Tasks 1 and 3</li> </ul> |
| Message-based | 28%        | <ul> <li>IWANTTOHELP – Tasks 1 and 2</li> <li>JOB SEARCH – Task 2</li> </ul>                                   |
| Mixed         | 6%         | <ul> <li>IWANTTOHELP – Task 4</li> </ul>   |

#### ■ Figure VI.2.2 ■

#### Digital reading tasks by text format

| Text format    | % of tasks | Sample tasks  |
|----------------|------------|---|
| Continuous     | 7%         | <ul> <li>IWANTTOHELP – Task 1</li> </ul>  |
| Non-continuous | 10%        | <ul> <li>JOB SEARCH – Task 1</li> </ul>   |
| Mixed          | 7%         | <ul> <li>JOB SEARCH – Task 3</li> </ul>   |
| Multiple       | 76%        | <ul> <li>IWANTTOHELP – Tasks 2, 3 and 4</li> <li>SMELL – Tasks 1, 2 and 3</li> <li>JOB SEARCH – Task 2</li> </ul> |

#### Figure VI.2.3

#### Digital reading tasks by text type

| Text type     | % of tasks | Sample tasks   |
|---------------|------------|--|
| Argumentation | 21%        | <ul> <li>IWANTTOHELP – Task 3</li> </ul>   |
| Description   | 31%        | <ul> <li>IWANTTOHELP – Tasks 1 and 2</li> <li>JOB SEARCH – Tasks 1, 2 and 3</li> </ul> |
| Exposition    | 31%        | • SMELL – Tasks 1, 2 and 3   |
| Transaction   | 14%        | -  |
| Mixed         | 3%         | <ul> <li>IWANTTOHELP – Task 4</li> </ul>   |

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### Figure VI.2.6 Digital reading tasks by situation

| Situation    | % of tasks | Sample tasks                                     |
|--------------|------------|--|
| Educational  | 10%        | -  |
| Occupational | 24%        | <ul><li>IWANTTOHELP</li><li>JOB SEARCH</li></ul> |
| Personal     | 21%        | -  |
| Public       | 45%        | • SMELL  |

### Figure VI.2.4 Digital reading tasks by aspect

| Aspect                  | % of tasks | Sample tasks   |
|-------------------------|------------|--|
| Access and retrieve     | 24%        | IWANTTOHELP – Tasks 1 and 2  |
| Integrate and interpret | 35%        | <ul> <li>IWANTTOHELP – Task 3</li> <li>SMELL – Tasks 1 and 3</li> <li>JOB SEARCH – Task 2</li> </ul> |
| Reflect and evaluate    | 21%        | <ul> <li>SMELL – Task 2</li> <li>JOB SEARCH – Tasks 1 and 3</li> </ul>                               |
| Complex                 | 21%        | <ul> <li>IWANTTOHELP – Task 4</li> </ul>   |

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### • A. Text processing

 Locate key pieces of information, interpret nuances of language, integrate different elements of the text, draw on prior knowledge of textual and linguistic structures and features, make judgements about the cogency of an argument or the appropriateness of the style, and reflect on the relationship between the content and his or her own experience or knowledge of the world.

### B. Navigation

 The cognitive process of moving around the digital medium to access information that is needed, traversing several pages or sites, predicting the likely content of a series of unseen screens, make decisions about which links and menus to use, in order to efficiently locate the required information





Both navigation and text-processing skills are required to complete most digital reading tasks

Design of the PISA 2009 digital reading tests and proficiency scale

- The PISA reading expert group recommended the final selection of tasks
  - technical quality of the tasks,
  - balance with respect to framework,
  - how they performed in the field trial,
  - their cultural appropriateness and interest for 15-year-olds as judged by the participating countries

Design of the PISA 2009 digital reading tests and proficiency scale

- The test
  - 29 tasks
  - -2/3 of tasks done by each student
  - $-40 \min + 10 \min \text{ practice}$
- Digital reading proficiency levels
   16 OECD countries + 3 partner countries
  - Level 5, Level 4, Level 3, Level 2, Below lvl 2
- Scale mean: 499, stdev: 90

#### Figure VI.2.18

#### Similarities and differences between digital and print reading assessments in PISA 2009

| Feature  | Digital reading  | Print reading  |
|--|--|--|
| Mode of delivery and data collection   | Computer-based delivery system                                       | Pencil and paper   |
| Number of countries participating in the assessment                            | A subset of 19 (16 OECD countries and 3 partner countries/economies) | 65 (34 OECD countries<br>and 31 partner countries/economies)               |
| Required number of students per country  | 1 500  | 4 500  |
| Actual average number of students per country that administered the assessment | OECD countries: 1944<br>Partner countries/economies: 1820            | OECD countries: 8800<br>Partner countries/economies: 5700                  |
| Average number of students per school that administered the assessment         | 10   | 30   |
| Number of items  | 29   | 131  |
| Number of score points   | 38   | 140  |
| Average test administration time per student                                   | 40 minutes   | 65 minutes   |
| Average number of score points yielded per student                             | 25   | 33   |
| Scale construction   | Single digital reading scale   | Single print reading scale and subscales based on aspects and text formats |

#### ■ Figure VI.2.8 ■

#### Summary descriptions for four levels of proficiency in digital reading

| Level            | Lower<br>score<br>limit | Percentage of students<br>able to perform tasks<br>at this level or above<br>(OECD average) | Characteristics of tasks   |
|------------------|-------------------------|---|--|
| 5<br>or<br>above | 626                     | 7.8%  | Tasks at this level typically require the reader to locate, analyse and critically evaluate information, related to an unfamiliar context, in the presence of ambiguity. They require generating criteria to evaluate the text. Tasks may require navigation across multiple sites without explicit direction, and detailed interrogation of texts in a variety of formats.  |
| 4                | 553                     | 30.3%   | Tasks at this level may require the reader to evaluate information from several sources, navigating across several sites comprising texts in a variety of formats, and generating criteria for evaluation in relation to a familiar, personal or practical context. Other tasks at this level demand that the reader interpret complex information according to well-defined criteria in a scientific or technical context.  |
| 3                | 480                     | 60.7%   | Tasks at this level require that the reader integrate information, either by navigating across several sites to find well-defined target information, or by generating simple categories when the task is not explicitly stated. Where evaluation is called for, only the information that is most directly accessible or only part of the available information is required.  |
| 2                | 407                     | 83.1%   | Tasks at this level typically require the reader to locate and interpret information that is<br>well-defined, usually relating to familiar contexts. They may require navigation across<br>a limited number of sites and the application of web-based navigation tools such as<br>drop-down menus, where explicit directions are provided or only low-level inference<br>is called for. Tasks may require integrating information presented in different formats,<br>recognising examples that fit clearly defined categories. |
| 1                |                         |   |  |

### A profile of PISA reading questions

- Complexity of navigation
  - Scrolling on page, page visits, prominence of information, navigation tool, navigation guidance
- Qualities of text
  - Structure, vocabulary, familiarity, length
- Explicitness of task demands
  - Level of direction, terminology, response criteria
- Nature of response
  - Level of abstraction, supplied concepts, level of inference, causation, contrast

#### Figure VI.2.9

#### Map of selected digital reading questions in PISA 2009, illustrating the proficiency levels

|   | Level            | Lower<br>score<br>limit | Task<br>(and score)                                    | Nature of task   | Quality<br>of text | Complexity<br>of<br>navigation | Explicitness<br>of task<br>demand | Nature<br>of<br>response |
|---|------------------|-------------------------|--|--|--------------------|--------------------------------|-----------------------------------|--------------------------|
|   | 5<br>or<br>above | 626                     | SMELL<br>Task 2 (657)                                  | Evaluate a web page in terms of credibility/<br>trustworthiness of information after following<br>an explicitly directed link from search results,<br>generating own criteria for evaluation.<br>Scroll to read the full text, which includes some<br>specialised (scientific) language.   | 4                  | 2                              | 3.5                               | 4                        |
|   | 4                |                         | JOB SEARCH<br>Task 2.2<br>full credit<br>(624)         | Analyse a list of options in a descriptive text<br>related to employment, using predefined criteria.<br>Follow two links using explicit instructions, and<br>scroll. Select four options from drop-down menus,<br>combining prior knowledge with information<br>integrated from a seond page. (Full Credit)                              | 2                  | 3.5                            | 2                                 | 3                        |
|   |                  |                         | <i>SMELL</i><br>Task 1 (572)                           | Distinguish between the main idea and subsidiary<br>ideas in an expository scientific text, in the<br>presence of strong distracting information. Follow<br>a link from search results to a web page using<br>a literal match, scrolling to read the full text.  | 3.5                | 2                              | 3                                 | 3                        |
|   |                  |                         | <i>IWANTTOHELP</i><br>Task 4.2<br>full credit<br>(567) | Integrate and reflect upon information from several<br>web pages by comparing short texts on multiple<br>pages of a website about community work with<br>criteria referred to on a personal blog; explain a<br>choice based on this comparison. Follow a series<br>of at least four links, using explicit instructions.<br>(Full Credit) | 3                  | 4                              | 3                                 | 3                        |
|   |                  | 553                     | JOB SEARCH<br>Task 3 (558)                             | Hypothesise about the reason for including<br>a condition in a job advertisement. Support<br>explanation using prior knowledge and information<br>from the text. No navigation required.   | 1.5                | 1                              | 4                                 | 3                        |
| n |                  |                         |  |  |                    |                                |                                   |                          |

#### Figure VI.2.9

#### Map of selected digital reading questions in PISA 2009, illustrating the proficiency levels

| Level      | Lower<br>score<br>limit | Task<br>(and score)                                | Nature of task  | Quality<br>of text | Complexity<br>of<br>navigation | Explicitness<br>of task<br>demand | Nature<br>of<br>response |
|------------|-------------------------|--|---|--------------------|--------------------------------|-----------------------------------|--------------------------|
| 3          |                         | IWANTTOHELP<br>Task 4.1<br>partial credit<br>(525) | Integrate information by comparing a short text on<br>one website about community work with criteria<br>referred to on a personal blog. Follow a series of<br>at least four links, using explicit instructions.<br>(Partial Credit) | 3                  | 4                              | 2                                 | 2                        |
|            | 480                     | SMELL<br>Task 3 (485)                              | Synthesise information from two websites,<br>following links from search results guided by<br>explicit directions. Identify a generalisation<br>common to information on the two sites using<br>low-level inference.                | 3                  | 3                              | 2                                 | 2                        |
| 2          |                         | JOB SEARCH<br>Task 1 (463)                         | Select a job suitable for a student from a list<br>of four search results comprising short descriptions<br>of jobs.   | 1.5                | 2                              | 2                                 | 2                        |
|            |                         | IWANTTOHELP<br>Task 3 (462)                        | Recognise the main purpose of a website dealing<br>with a community activity from a short description<br>on its Home page. Follow a single link with explicit<br>directions.  | 1.5                | 2                              | 2                                 | 2                        |
|            |                         | JOB SEARCH<br>Task 2.1<br>partial credit<br>(462)  | Analyse a list of options in a descriptive text related<br>to employment, using predefined criteria. Follow<br>two links using explicit instructions. Select three<br>suitable options from drop-down menus.<br>(Partial Credit)    | 2                  | 2                              | 2                                 | 1.5                      |
|            | 407                     | IWANTTOHELP<br>Task 2 (417)                        | Locate explicitly stated personal information on a page of a personal blog, following one explicitly directed link and using two literal matches between task and text.   | 1                  | 2                              | 1                                 | 1.5                      |
| Below<br>2 |                         | IWANTTOHELP<br>Task 1 (362)                        | Locate explicitly stated information in a personal<br>blog. Find a synonymous match between the task<br>and the text. No navigation required.   | 1                  | 1                              | 1.5                               | 1.5                      |

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### What students can do in digital reading



### What students can do in digital reading



#### Figure VI.2.20

#### Percentage of students at each proficiency level on the digital and print reading scales



|                              | Percentage of students<br>below Level 2 | Percentage of students<br>at Level 2 or above |                           |
|------------------------------|---|---|---------------------------|
| Korea                        |   |   | Korea                     |
| Japan                        |   |   | lapan                     |
| Australia                    |   |   | Australia                 |
| Hong Kong-China              |   |   | Hong Kong-China           |
| New Zealand                  |   |   | New Zealand               |
| Macao-China                  |   |   | Macao-China               |
| Ireland                      |   |   | reland                    |
| Iceland                      |   |   | celand                    |
| Sweden                       |   |   | 5weden                    |
| Norway                       | 8                                       |   | Norway                    |
| Belgium                      | E                                       |   | Belgium                   |
| Denmark                      |   |   | Denmark                   |
| France                       |   |   | France                    |
| OECD average-16              | E                                       |   | OECD average-16           |
| Spain                        |   |   | Spain                     |
| Poland                       |   |   | Poland                    |
| Hungary                      |   |   | Hungary                   |
| Austria                      |   |   | Austria                   |
| Chile                        |   |   | Chile                     |
| Colombia                     |   |   | Colombia                  |
| Percentage 10<br>of students | 0 80 60 40 20                           | 0 20 40 60 80 100                             | Percentage<br>of students |

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#### ■ Figure VI.2.21 ■

#### Comparison of mean performance in digital and print reading

|          |                 | Digital reading |       | Print reading |       | Difference between digital and print |      |
|----------|-----------------|-----------------|-------|---------------|-------|--------------------------------------|------|
|          |                 | Mean score      | S.E.  | Mean score    | S.E.  | Mean dif.                            | S.E. |
| OECD     | Australia       | 537             | (2.8) | 515           | (2.3) | 21.70                                | 1.81 |
|          | Austria         | 459             | (3.9) | 470           | (2.9) | -11.70                               | 2.98 |
|          | Belgium         | 507             | (2.1) | 506           | (2.3) | 1.45                                 | 1.61 |
|          | Chile           | 435             | (3.6) | 449           | (3.1) | -14.85                               | 2.41 |
|          | Denmark         | 489             | (2.6) | 495           | (2.1) | -5.99                                | 1.91 |
|          | Spain           | 475             | (3.8) | 480           | (3.1) | -4.95                                | 2.79 |
|          | France          | 494             | (5.2) | 496           | (3.4) | -1.35                                | 4.82 |
| Partners | Hungary         | 468             | (4.2) | 494           | (3.2) | -25.84                               | 2.92 |
|          | Ireland         | 509             | (2.8) | 496           | (3.0) | 13.27                                | 2.64 |
|          | Iceland         | 512             | (1.4) | 500           | (1.4) | 11.56                                | 0.94 |
|          | Japan           | 519             | (2.4) | 520           | (3.5) | -0.63                                | 2.91 |
|          | Korea           | 568             | (3.0) | 539           | (3.5) | 28.31                                | 1.99 |
|          | Norway          | 500             | (2.8) | 503           | (2.6) | -3.28                                | 2.00 |
|          | New Zealand     | 537             | (2.3) | 521           | (2.4) | 16.48                                | 1.70 |
|          | Poland          | 464             | (3.1) | 500           | (2.6) | -36.96                               | 2.20 |
|          | Sweden          | 510             | (3.3) | 497           | (2.9) | 12.90                                | 2.11 |
|          | OECD average-16 | 499             | (0.8) | 499           | (0.7) | 0.01                                 | 0.63 |
|          | Colombia        | 368             | (3.4) | 412           | (3.6) | -43.06                               | 2.64 |
|          | Hong Kong-China | 515             | (2.6) | 533           | (2.1) | -18.36                               | 2.40 |
|          | Macao-China     | 492             | (0.7) | 487           | (0.9) | 5.29                                 | 0.84 |
### ■ Figure VI.2.22 ■

### Where countries rank in digital and print reading performance

Statistically significantly above the OECD average

Not statistically significantly different from the OECD average

Statistically significantly below the OECD average

|                 | Digital reading scale |       |            |            |               |             |       | Print reading scale |            |            |                         |            |  |  |
|-----------------|-----------------------|-------|------------|------------|---------------|-------------|-------|---------------------|------------|------------|-------------------------|------------|--|--|
|                 |                       |       |            | Range      | of rank       |             |       |                     |            | Range      | of rank                 |            |  |  |
|                 | Moon                  |       | OECD o     | ountries   | All countries | s/economies | Moon  |                     | OECD o     | ountries   | All countries/economies |            |  |  |
|                 | score                 | S.E.  | Upper rank | Lower rank | Upper rank    | Lower rank  | score | S.E.                | Upper rank | Lower rank | Upper rank              | Lower rank |  |  |
| Korea           | 568                   | (3.0) | 1          | 1          | 1             | 1           | 539   | (3.5)               | 1          | 1          | 1                       | 2          |  |  |
| New Zealand     | 537                   | (2.3) | 2          | 3          | 2             | 3           | 521   | (2.4)               | 2          | 3          | 3                       | 4          |  |  |
| Australia       | 537                   | (2.8) | 2          | 3          | 2             | 3           | 515   | (2.3)               | 3          | 4          | 4                       | 5          |  |  |
| Japan           | 519                   | (2.4) | 4          | 4          | 4             | 5           | 520   | (3.5)               | 2          | 4          | 3                       | 5          |  |  |
| Hong Kong-China | 515                   | (2.6) |            |            | 4             | 7           | 533   | (2.1)               |            |            | 1                       | 2          |  |  |
| Iceland         | 512                   | (1.4) | 5          | 7          | 5             | 8           | 500   | (1.4)               | 6          | 10         | 7                       | 11         |  |  |
| Sweden          | 510                   | (3.3) | 5          | 8          | 5             | 9           | 497   | (2.9)               | 7          | 13         | 8                       | 14         |  |  |
| Ireland         | 509                   | (2.8) | 5          | 8          | 6             | 9           | 496   | (3.0)               | 8          | 13         | 9                       | 14         |  |  |
| Belgium         | 507                   | (2.1) | 6          | 8          | 7             | 9           | 506   | (2.3)               | 5          | 7          | 6                       | 8          |  |  |
| Norway          | 500                   | (2.8) | 9          | 10         | 10            | 11          | 503   | (2.6)               | 5          | 9          | 6                       | 10         |  |  |
| France          | 494                   | (5.2) | 9          | 11         | 10            | 13          | 496   | (3.4)               | 7          | 13         | 8                       | 14         |  |  |
| Macao-China     | 492                   | (0.7) |            |            | 11            | 13          | 487   | (0.9)               |            |            | 15                      | 15         |  |  |
| Denmark         | 489                   | (2.6) | 10         | 11         | 11            | 13          | 495   | (2.1)               | 9          | 13         | 10                      | 14         |  |  |
| Spain           | 475                   | (3.8) | 12         | 13         | 14            | 15          | 481   | (2.0)               | 14         | 14         | 16                      | 16         |  |  |
| Hungary         | 468                   | (4.2) | 12         | 14         | 14            | 16          | 494   | (3.2)               | 9          | 13         | 9                       | 14         |  |  |
| Poland          | 464                   | (3.1) | 13         | 15         | 15            | 17          | 500   | (2.6)               | 5          | 11         | 6                       | 12         |  |  |
| Austria         | 459                   | (3.9) | 14         | 15         | 16            | 17          | 470   | (2.9)               | 15         | 15         | 17                      | 17         |  |  |
| Chile           | 435                   | (3.6) | 16         | 16         | 18            | 18          | 449   | (3.1)               | 16         | 16         | 18                      | 18         |  |  |
| Colombia        | 368                   | (3.4) |            |            | 19            | 19          | 413   | (3.7)               |            |            | 19                      | 19         |  |  |

## Íslenskir nemendur við lok grunnskólans

Helstu niðurstöður PISA 2009 rannsóknarinnar um lesskilning og læsi í stærðfræði og náttúrufræði

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Almar M. Halldórsson Ragnar F. Ólafsson Óskar H. Nielsson Júlíus K. Björnsson

Rit nr. 3. 2010

NAMSMATSSTOPNUN

## Lesskilningur 15 ára nemenda á Íslandi og í öðrum löndum í PISA 2009

|                | L               | .esskilningur |             | Fæ<br>Endurheimt<br>upplýsingar | rnisvið lesskilni<br>Skilningur og<br>túlkun á efni | ngs<br>Íhugun og mat<br>á innihaldi | Textaform<br>Samfelldur<br>texti | verkefna<br>Ósamfelldur<br>texti |
|----------------|-----------------|---------------|-------------|---------------------------------|---|-------------------------------------|----------------------------------|----------------------------------|
|                | Staða m.v. Ísl. | Meðaltal      | Staðalvilla | Staða m.v. Ísl.                 | Staða m.v. Ísl.                                     | Staða m.v. Ísl.                     | Staða m.v. Ísl.                  | Staða m.v. Ísl.                  |
| Sjanghæ Kína   |                 | 556           | (2,4)       |                                 |   |                                     |                                  |                                  |
| Kórea          | <b>A</b>        | 539           | (3,5)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         | <b>A</b>                         |
| Finnland       | <b>A</b>        | 536           | (2,3)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         | <b>A</b>                         |
| Hong Kong Kína |                 | 533           | (2,1)       | <b>A</b>                        | <b>A</b>  |                                     |                                  | <b>A</b>                         |
| Singapúr       |                 | 526           | (1,1)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         |                                  |
| Kanada         |                 | 524           | (1,5)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         |                                  |
| Nýja Sjáland   |                 | 521           | (2,4)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         | <b>A</b>                         |
| Japan          |                 | 520           | (3,5)       | <b>A</b>                        | <b>A</b>  | <b>A</b>                            | <b>A</b>                         | <b>A</b>                         |
| Ástralía       |                 | 515           | (2,3)       | <b>A</b>                        |   | <b>A</b>                            | <b>A</b>                         |                                  |
| Holland        | -               | 508           | (5,1)       | <b>A</b>                        | -   | <b>A</b>                            | -                                | <b>A</b>                         |
| Belgía         |                 | 506           | (2,3)       | <b>A</b>                        | -   | <b>A</b>                            | -                                |                                  |
| Noregur        | -               | 503           | (2,6)       | -                               | -   | <b>A</b>                            | -                                | -                                |
| Eistland       | -               | 501           | (2,6)       | -                               | -   | -                                   | -                                |                                  |
| Sviss          | -               | 501           | (2,4)       | -                               | -   | -                                   | -                                |                                  |
| Pólland        | -               | 500           | (2,6)       | ▼                               | -   | -                                   | -                                | -                                |
| Ísland         |                 | 500           | (1,4)       |                                 |   |                                     |                                  |                                  |

### Í 10 löndum af 65 er betri lesskilningur

|   |                      | L               | esskilningur |             | Fæ<br>Endurheimt<br>upplýsingar | rnisvið lesskilni<br>Skilningur og<br>túlkun á efni | ngs<br>Íhugun og mat<br>á innihaldi | Textaform<br>Samfelldur<br>texti | verkefna<br>Ósamfelldur<br>texti |
|---|----------------------|-----------------|--------------|-------------|---------------------------------|---|-------------------------------------|----------------------------------|----------------------------------|
|   |                      | Staða m.v. Ísl. | Meðaltal     | Staðalvilla | Staða m.v. Ísl.                 | Staða m.v. Ísl.                                     | Staða m.v. Ísl.                     | Staða m.v. Ísl.                  | Staða m.v. Ísl.                  |
|   |                      |                 |              |             |                                 |   |                                     |                                  |                                  |
|   | Holland              | -               | 508          | (5,1)       | <b>A</b>                        | -   |                                     | -                                |                                  |
| = | Belgía               |                 | 506          | (2,3)       | <b>A</b>                        | -   | <b>A</b>                            | -                                |                                  |
|   | Noregur              | -               | 503          | (2,6)       | -                               | -   |                                     | -                                | -                                |
|   | Eistland             | -               | 501          | (2,6)       | -                               | -   | -                                   | -                                |                                  |
|   | Sviss                | -               | 501          | (2,4)       | -                               | -   | -                                   | -                                |                                  |
|   | Polland              | -               | 500          | (2,6)       |                                 | -   | -                                   | -                                | -                                |
|   | Island               |                 | 500          | (1,4)       | _                               |   |                                     |                                  |                                  |
|   | Bandaríkin           | -               | 500          | (3,7)       |                                 | -   | <b>A</b>                            | -                                | -                                |
| _ | Liechtenstein        | -               | 499          | (2,8)       | -                               | -   | -                                   | -                                |                                  |
| _ | SVIPJ00<br>Diveloand | -               | 497          | (2,9)       | -                               |   | -                                   | -                                | -                                |
|   | MEDALTAL OFOD        | -               | 497          | (2,7)       | -                               | -   | •                                   | -                                | -                                |
| _ | MEDALIAL VECD        | •               | 490          | (2.0)       |                                 |   | -                                   | •                                | •                                |
| = | Iriano<br>Frakkland  | -               | 496          | (3,0)       |                                 |   | -                                   | -                                | -                                |
|   | Takkianu             | -               | 490          | (3,4)       |                                 | -   | -                                   | -                                | -                                |
|   | Doomörk              | -               | 495          | (2,0)       |                                 | -   | -                                   | -                                | -                                |
|   | Brotland             | <b>.</b>        | 495          | (2,1)       | -                               | ¥   |                                     |                                  | <b>•</b>                         |
|   | Unoverialand         | _               | 494          | (3.2)       | _                               | -   | _                                   | _                                | <b>•</b>                         |

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|                        |          |     | (-,-,  |          |          |          |          |          |
|------------------------|----------|-----|--------|----------|----------|----------|----------|----------|
| Ísland                 |          | 500 | (1,4)  |          |          |          |          |          |
| Bandaríkin             | -        | 500 | (3,7)  | <b>V</b> | -        |          | -        | -        |
| Liechtenstein          | -        | 499 | (2,8)  | -        | -        | -        | -        |          |
| Svíbióð                | -        | 497 | (2.9)  | -        | <b>V</b> | -        | -        | -        |
| Þýskaland              | -        | 497 | (2.7)  | -        | -        | -        | -        | -        |
| MEĐALTAL OECD          | <b>V</b> | 496 |        | ▼        | •        | -        | <b>V</b> | <b>V</b> |
| Írland                 | _        | 496 | (3.0)  |          |          | -        | -        | _        |
| Frakkland              | _        | 496 | (3, 4) | <b>_</b> | <u>_</u> | _        | _        | _        |
| Taínei                 | _        | 400 | (2,6)  | <b>_</b> | _        | _        | _        | _        |
| Danmörk                | <b>•</b> | 405 | (2,1)  | <u>_</u> | -<br>-   |          | _        | <b>•</b> |
| Brotland               | <b>•</b> | 400 | (23)   | <b>–</b> | <b>.</b> |          |          | <b>.</b> |
| Lingvorialand          | •        | 404 | (2,0)  |          |          | -        |          | <b>.</b> |
| Drigverjalariu         | -        | 494 | (3,2)  | -        | -        | -        | -        | <u> </u> |
| Fortugal<br>Makaá Kína |          | 409 | (0,1)  | •        |          | -        | -        |          |
| IVIANAU MITIA          |          | 407 | (0,9)  | -        |          |          |          |          |
| Italia                 | <u> </u> | 480 | (1,0)  |          |          | •        |          | <u> </u> |
| Lettiand               | <u> </u> | 484 | (3,0)  |          |          | -        |          | <u> </u> |
| Slovenia               | <u> </u> | 483 | (1,0)  | <u> </u> | <u> </u> | •        | •        | <u> </u> |
| Grikkland              | <b>•</b> | 483 | (4,3)  | <u> </u> | <u> </u> | -        | <u> </u> | <u> </u> |
| Spann                  | <b>•</b> | 481 | (2,0)  | <u> </u> |
| Tekkland               | <b>•</b> | 4/8 | (2,9)  | •        | <u> </u> | <u> </u> |          | <u> </u> |
| Slovakia               | <b>•</b> | 4// | (2,5)  | -        | <u> </u> | <u> </u> | <b>•</b> | <b>_</b> |
| Kroatia                | <b>•</b> | 4/6 | (2,9)  | -        | <u> </u> | <u> </u> | <b>•</b> | <b>•</b> |
| Israel                 |          | 4/4 | (3,6)  |          | <b>•</b> | <b>•</b> | <b>•</b> |          |
| Lúxemborg              |          | 472 | (1,3)  | <b>•</b> | <b>•</b> | •        | <b>•</b> | •        |
| Austurriki             |          | 470 | (2,9)  | <b>•</b> | <b>•</b> | •        | <b>•</b> | •        |
| Litháen                | •        | 468 | (2,4)  | ▼        | ▼        | •        | <b>•</b> | ▼        |
| Tyrkland               | ▼        | 464 | (3,5)  | ▼        | ▼        | •        | <b>•</b> | ▼        |
| Dúbæ (SAF)             | ▼        | 459 | (1,1)  | ▼        | ▼        | •        | <b>•</b> | ▼        |
| Rússland               | ▼        | 459 | (3,3)  | ▼        | ▼        | •        | <b>•</b> | ▼        |
| Chile                  | ▼        | 449 | (3,1)  | ▼        | ▼        | •        | ▼        | ▼        |
| Serbía                 | ▼        | 442 | (2,4)  | ▼        | ▼        | •        | ▼        | ▼        |
| Búlgaría               | ▼        | 429 | (6,7)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Úrugvæ                 | ▼        | 426 | (2,6)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Mexíkó                 | ▼        | 425 | (2,0)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Rúmenía                | ▼        | 424 | (4,1)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Taíland                | ▼        | 421 | (2,6)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Trínidad og Tóbagó     | ▼        | 416 | (1,2)  | <b>V</b> | <b>V</b> | ▼        | ▼        | ▼        |
| Kólumbía               | ▼        | 413 | (3,7)  | ▼        | <b>V</b> | ▼        | ▼        | ▼        |
| Brasilía               | ▼        | 412 | (2,7)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Svartfjallaland        | ▼        | 408 | (1,7)  | <b>V</b> | <b>V</b> | ▼        | <b>V</b> | <b>V</b> |
| Jórdanía               | ▼        | 405 | (3,3)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Túnis                  | ▼        | 404 | (2,9)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Indónesía              | ▼        | 402 | (3,7)  | ▼        | ▼        | ▼        | ▼        | ▼        |
| Argentína              | ▼        | 394 | (4,6)  | <b>V</b> | V        | ▼        | ▼        | <b>V</b> |
| Kasakstan              | ▼        | 397 | (3,1)  | <b>V</b> | ▼        | ▼        | ▼        | ▼        |
| Albanía                | ▼        | 380 | (4,0)  | <b>V</b> | ▼        | ▼        | ▼        | ▼        |
| Katar                  | ▼        | 354 | (0,8)  | ▼        | <b>V</b> | ▼        | ▼        | ▼        |
| Panama                 | ▼        | 363 | (6,5)  | <b>V</b> | <b>V</b> | ▼        | <b>V</b> | ▼        |
| Perú                   | ▼        | 364 | (4,0)  | <b>V</b> | <b>V</b> | ▼        | <b>V</b> | ▼        |
| Aserbaíjan             | ▼        | 361 | (3,3)  | <b>V</b> | <b>V</b> | ▼        | <b>V</b> | ▼        |
| Kirgistan              | ▼        | 299 | (3,2)  | ▼        | ▼        | <b>V</b> | ▼        | ▼        |

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# Ísland

- Ef öll OECD löndin tækju þátt í ERA...
  - Lesskilningur á pappír: 9-16 sæti af 34 OECD löndum.
  - Lesskilningur á rafrænan texta: 5-7 sæti af 16
     OECD löndum
    - 34/16 = 2,12 x (5-7 sæti) = 11-15 sæti
    - Sambærilegt við <u>11-15 sæti</u> af 34 OECD löndum.

### ■ Figure VI.2.13 ■

### Gender differences in digital reading performance





### Figure VI.2.23





# Navigation in the PISA 2009 Digital Reading Assessment

3.



## Navigation

A students' navigational path (nav. index) *– number of relevant pages visited – number of visits to relevant pages – number of page visits*





|              | [Part 1/1]  |
|--------------|---|
| Table VI.3.2 | Correlations of navigation indices with digital reading scores (WLEs) |

|     |                 |                  | Correlations of  | navigation indices with di | gital reading scores (W | LEs) by country |             |
|-----|-----------------|------------------|------------------|----------------------------|-------------------------|-----------------|-------------|
|     |                 | Number of releva | nt pages visited | Number of visits t         | o relevant pages        | Number of p     | oage visits |
|     |                 | Correlation      | S.E.             | Correlation                | S.E.                    | Correlation     | S.E.        |
| 0   | Australia       | 0.80             | (0.01)           | 0.60                       | (0.02)                  | 0.37            | (0.02)      |
| EC  | Austria         | 0.84             | (0.01)           | 0.72                       | (0.01)                  | 0.55            | (0.02)      |
| 0   | Belgium         | 0.82             | (0.01)           | 0.63                       | (0.01)                  | 0.38            | (0.03)      |
|     | Chile           | 0.81             | (0.01)           | 0.63                       | (0.02)                  | 0.47            | (0.03)      |
|     | Denmark         | 0.81             | (0.02)           | 0.63                       | (0.03)                  | 0.41            | (0.04)      |
|     | France          | 0.85             | (0.02)           | 0.62                       | (0.04)                  | 0.42            | (0.04)      |
|     | Hungary         | 0.86             | (0.01)           | 0.75                       | (0.02)                  | 0.59            | (0.03)      |
|     | Iceland         | 0.79             | (0.01)           | 0.58                       | (0.03)                  | 0.37            | (0.03)      |
|     | Ireland         | 0.82             | (0.01)           | 0.64                       | (0.02)                  | 0.42            | (0.03)      |
|     | Japan           | 0.74             | (0.02)           | 0.51                       | (0.04)                  | 0.35            | (0.04)      |
|     | Korea           | 0.68             | (0.03)           | 0.39                       | (0.04)                  | 0.20            | (0.04)      |
|     | New Zealand     | 0.79             | (0.01)           | 0.56                       | (0.02)                  | 0.29            | (0.03)      |
|     | Norway          | 0.81             | (0.01)           | 0.65                       | (0.02)                  | 0.49            | (0.02)      |
|     | Poland          | 0.85             | (0.01)           | 0.70                       | (0.01)                  | 0.55            | (0.02)      |
|     | Spain           | 0.84             | (0.01)           | 0.65                       | (0.03)                  | 0.47            | (0.03)      |
|     | Sweden          | 0.79             | (0.01)           | 0.61                       | (0.02)                  | 0.41            | (0.03)      |
|     | OECD average-16 | 0.81             | (0.00)           | 0.62                       | (0.01)                  | 0.42            | (0.01)      |
| _   |                 |                  | 1                |                            | 10 0.00                 | -               |             |
| ers | Colombia        | 0.76             | (0.01)           | 0.56                       | (0.03)                  | 0.46            | (0.03)      |
| rtn | Hong Kong-China | 0.77             | (0.01)           | 0.56                       | (0.03)                  | 0.35            | (0.03)      |
| Pa  | Macao-China     | 0.71             | (0.01)           | 0.42                       | (0.02)                  | 0.15            | (0.03)      |

|              | [Part 1/1]  |
|--------------|---|
| Table VI.3.3 | Correlations of navigation indices with print reading scores (WLEs) |

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|     |                 |                  | Correlations of  | of navigation indices with p | orint reading scores (W | LEs) by country |             |
|-----|-----------------|------------------|------------------|------------------------------|-------------------------|-----------------|-------------|
|     |                 | Number of releva | nt pages visited | Number of visits to          | o relevant pages        | Number of       | page visits |
|     |                 | Correlation      | S.E.             | Correlation                  | S.E.                    | Correlation     | S.E.        |
| D   | Australia       | 0.63             | (0.01)           | 0.48                         | (0.02)                  | 0.31            | (0.02)      |
| E   | Austria         | 0.67             | (0.01)           | 0.57                         | (0.02)                  | 0.43            | (0.02)      |
| 0   | Belgium         | 0.69             | (0.01)           | 0.55                         | (0.01)                  | 0.35            | (0.02)      |
|     | Chile           | 0.64             | (0.02)           | 0.52                         | (0.02)                  | 0.41            | (0.03)      |
|     | Denmark         | 0.61             | (0.03)           | 0.47                         | (0.03)                  | 0.30            | (0.04)      |
|     | France          | 0.58             | (0.06)           | 0.46                         | (0.04)                  | 0.32            | (0.04)      |
|     | Hungary         | 0.72             | (0.02)           | 0.63                         | (0.03)                  | 0.51            | (0.03)      |
|     | Iceland         | 0.62             | (0.02)           | 0.47                         | (0.03)                  | 0.31            | (0.03)      |
|     | Ireland         | 0.61             | (0.02)           | 0.46                         | (0.02)                  | 0.29            | (0.03)      |
|     | Japan           | 0.48             | (0.03)           | 0.33                         | (0.04)                  | 0.22            | (0.03)      |
|     | Korea           | 0.54             | (0.04)           | 0.35                         | (0.04)                  | 0.18            | (0.04)      |
|     | New Zealand     | 0.62             | (0.02)           | 0.42                         | (0.03)                  | 0.19            | (0.03)      |
|     | Norway          | 0.58             | (0.02)           | 0.46                         | (0.02)                  | 0.35            | (0.02)      |
|     | Poland          | 0.67             | (0.02)           | 0.55                         | (0.02)                  | 0.43            | (0.02)      |
|     | Spain           | 0.64             | (0.02)           | 0.49                         | (0.03)                  | 0.35            | (0.03)      |
|     | Sweden          | 0.64             | (0.02)           | 0.48                         | (0.02)                  | 0.32            | (0.02)      |
|     | OECD average-16 | 0.62             | (0.01)           | 0.48                         | (0.01)                  | 0.33            | (0.01)      |
| _   |                 |                  |                  |                              |                         |                 |             |
| ers | Colombia        | 0.58             | (0.03)           | 0.47                         | (0.04)                  | 0.41            | (0.03)      |
| rtn | Hong Kong-China | 0.48             | (0.03)           | 0.32                         | (0.04)                  | 0.20            | (0.04)      |
| Pa  | Macao-China     | 0.43             | (0.02)           | 0.24                         | (0.02)                  | 0.06            | (0.03)      |

## Message

- Successful reading in the digital medium requires effective navigation, and that it cannot be assumed that students can simply transfer reading skills learned in print reading to this medium.
- Effective navigation requires students to construct pathways to pages with information relevant to the task.

## Message

- Although the navigation demands of the digital reading assessment are modest, many students find it hard to cope with them. Even when the guidance is quite explicit, significant numbers of students still fail to locate crucial pages.
- Thus teachers and policy makers should not assume that students can navigate successfully or methodically in the vast realm of possibilities that the Internet offers them.
- Simply turning students loose in the digital medium, without clear direction, is likely to increase the risk that they will waste time, become frustrated, and fail to engage productively as readers.



## Message

- Students should be encouraged to define their reading task before they start to navigate. They need clear purposes for reading, encouragement to clarify these purposes before embarking on navigating, and practice in evaluating and selecting both the links they choose to follow and the material they will then be able to read.
- Before embarking on a navigation path, students should determine why they are reading and what information they are looking for, to reduce the likelihood that they will become disoriented or waste time by visiting irrelevant pages.



Relationships between Digital Reading Performance and Student Background, Engagement and Reading Strategies



#### Figure VI.4.1

### Strength of socio-economic gradient and reading performance

Both, the digital reading performance and the strength of the relationship between performance and socio-economic background are significantly different from the OECD average.

♦ The digital reading performance and/or the strength of the relationship between performance and socio-economic background are not significantly different from the OECD average.



Digital reading

Percentage of variance in digital reading performance explained by the PISA index of economic, social and cultural status (r-squared x 100)

#### Figure VI.4.1

### Strength of socio-economic gradient and reading performance

Both, the digital reading performance and the strength of the relationship between performance and socio-economic background are significantly different from the OECD average.

The digital reading performance and/or the strength of the relationship between performance and socio-economic background are not significantly different from the OECD average.



Percentage of variance in print reading performance explained by the PISA index of economic, social and cultural status (r-squared x 100)

### Figure VI.4.2 Student performance in digital reading and immigrant status

■ Native ■ Second-generation ■ First-generation



## Student engagement and attitudes

- Enjoyment of reading
- Diversity of reading

The second level indicates that associations among engagement, reading strategies and performance are circular. Engaging in reading activities, adopting effective reading strategies and being a proficient reader are mutually dependent: as students read more they become better readers; and when they read well and expect good performance in reading, they tend to read more and enjoy reading (Nurmi, *et al.*, 2003).

The graph below illustrates how results of associations between how engaged in reading activities students are, the reading strategies they adopt, and how well they read should be interpreted in the context of the two levels of reinforcement.



### Figure VI.4.4

Relationship between enjoyment of reading and digital reading performance



1

# Ánægja af lestri

## (enjoyment of reading)

Nemendur voru spurðir hve sammála þeir væri eftirfarandi staðhæfingum um lestur (mjög sammála, sammála, ósammála eða mjög ósammála):

- (1) Ég les bara þegar ég verð að gera það,
- (2) Lestur er eitt af uppáhalds áhugamálum mínum,
- (3) Mér finnst gaman að tala um bækur við aðra,
- (4) Mér finnst erfitt að klára bækur,
- (5) Ég verð ánægð(ur) ef ég fæ bók að gjöf,
- (6) Lestur er tímasóun fyrir mig,
- (7) Mér finnst gaman að fara í bókabúð eða á bókasafn,
- (8) Ég les eingöngu til að fá þær upplýsingar sem ég þarfnast,
- (9) Ég get ekki setið kyrr og lesið í meira en nokkrar mínútur,
- (10) Mér finnst gaman að segja hvað mér finnst um bækur sem ég hef lesið,
- (11) Mér finnst gaman að skipta á bókum við vini mína.

Svörum við staðhæfningum sem eru neikvætt orðaðar (1, 4, 6, 8 og 9) er snúið við svo að hærri gildi teljist til hærra gildis á mælikvarðanum.

### Figure VI.4.5

### Relationship between diversity of reading and digital reading performance



## **Fjölbreytni í lesefni** (diversity in reading)

- Hve oft lestu eftirtalið <u>vegna þess að þig</u> <u>langar til þess</u>?
  - Tímarit
  - Teiknimyndasögur
  - Skáldsögur

- Aldrei eða næstum aldrei
   Fáein skipti á ári
   U.þ.b. einu sinn í mánuði
   Nokkrum sinnum í mánuði
  - 🗖 Nokkrum sinnum í viku
- Bókmenntir aðrar en skáldsögur
- Dagblöð.

## Online reading practices

1





### **Online reading practices and digital reading proficiency**

Figure VI.4.8

Relationship between online searching-information activities and digital reading performance



## Figure VI.4.9 Figure VI.4.9 Relationship between online social activities and digital reading performance

| % of expla<br>varian<br>student perform | ained<br>ice in<br>iance |      | Bottom | quarter<br>quarter | □ Th<br>▷▶ To | ird quarte<br>p quarter | r                    |         |      |
|---|--------------------------|------|--------|--------------------|---------------|-------------------------|----------------------|---------|------|
| Chile                                   | 8                        |      | F      | <b></b>            | ₽             |                         |                      |         |      |
| Colombia                                | 8                        |      |        |                    |               |                         |                      |         |      |
| Poland                                  | 6                        |      |        | ► <b> </b>         | ₽□            |                         |                      |         |      |
| Hungary                                 | 3                        |      |        | ⊢                  |               |                         |                      |         |      |
| New Zealand                             | 2                        |      |        |                    |               |                         |                      |         |      |
| OECD average-16                         | 1                        |      |        |                    | H             | $\sim$                  |                      |         |      |
| Korea                                   | 1                        |      |        |                    |               |                         |                      |         |      |
| Macao-China                             | 1                        |      |        |                    | K)⊅           | 1                       |                      |         |      |
| France                                  | 1                        |      |        |                    | −F⊳           | $\overline{\mathbf{a}}$ |                      |         |      |
| Spain                                   | 1                        |      |        |                    | ⊩⊳∕∎          |                         |                      |         |      |
| Hong Kong-China                         | 0                        |      |        |                    |               | H.X                     |                      |         |      |
| Ireland                                 | 0                        |      |        |                    | ŀ             | -►>⊇                    |                      |         |      |
| Belgium                                 | 0                        |      |        |                    |               | ୲⊳⊣⊑⊘                   |                      |         |      |
| Australia                               | 0                        |      |        |                    |               |                         | ž.                   |         |      |
| Japan                                   | 0                        |      |        |                    |               |                         |                      |         |      |
| Norway                                  | 0                        |      |        |                    |               | <.                      |                      |         |      |
| Austria                                 | 0                        |      |        |                    | ⊳H¢           |                         |                      |         |      |
| Iceland                                 | 0                        |      |        |                    |               |                         |                      |         |      |
| Sweden                                  | 0                        |      |        |                    |               |                         |                      |         |      |
| Denmark                                 | 0                        |      |        |                    | 1             |                         |                      |         | <br> |
|   | 30                       | 00 3 | 50 40  | 0 45               | 50 50         | )0 5<br>Digita          | 50 60<br>reading sco | 0<br>re |      |

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# Students' Familiarity with Information and Communication Technologies

5.



### Figure VI.5.2

#### Percentage of students who reported having a computer at home in PISA 2000 and 2009



### Figure VI.5.3

### Percentage of students who reported having a computer at home, by socio-economic background




#### Percentage of students who reported having access to the Internet at home, by socio-economic background



- Socio-economically disadvantaged students
- $\blacktriangle$   $\bigtriangleup$  Socio-economically advantaged students







Ratio of computers to the number of students in school

#### Percentage of students in schools where the principal reported shortage or inadequacy of computers for instruction, by socio-economic background



#### Percentage of students who reported using a computer at home and at school



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### Figure VI.5.13 Percentage of students who reported using the Internet at home and at school



#### Percentage of students who reported that they did the following activities at home for leisure at least once a week, OECD average-28





#### Index of computer use at home for leisure, by gender and socio-economic background



Countries are ranked in descending order of the mean index of all students.

Index of computer use at home for leisure, by gender and socio-economic background



Note: All gender differences are statistically significant. Countries are ranked in descending order of the gender differences (B - G).

#### Percentage of students who reported that they did the following activities at home for schoolwork at least once a week, OECD average-29



#### Index of computer use at home for schoolwork-related tasks, by gender and socio-economic background



Countries are ranked in descending order of the mean index of all students.



Index of computer use at home for schoolwork-related tasks, by gender and socio-economic background



Note: Countries in which gender differences are statistically significant are marked in a darker tone. Countries are ranked in descending order of the gender differences (B - G).

#### Percentage of students who reported that they did the following activities at school at least once a week, OECD average-29





Countries are ranked in descending order of the mean index of all students.

# 1





Note: Countries in which gender differences are statistically significant are marked in a darker tone. Countries are ranked in descending order of the gender differences (B - G).



## Percentage of students who reported that they use a computer during regular classroom lessons at least some time during a typical week, OECD average-29



1. OECD average for computer use during classroom lessons in a typical school week, not adjusted for the number of students who do not have any lessons in the subject each week.

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## Figure VI.5.23 Percentage of students who reported using laptops at school