HKPISA

Results from HKPISA 2009

Hong Kong Students On Line: Digital Technologies and Reading in PISA 2009

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28 June2011

DEFINITION OF DIGITAL READING

- PISA: the first large-scale international study to assess performance in digital reading.
- Digital reading demands new emphases and strategies be added to readers' repertoire.
- Gathering information in the Internet requires skimming and scanning through large quantity of material and immediately evaluating its credibility.
- Critical thinking becomes more important in reading literacy.
- Overcoming the "digital divide" means:
  - Not only achieving online access,
  - Also enhancing the ability to integrate, evaluate and communicate information

(PISA2009 conceptual framework)

TEST DESIGN

- Students attempt computer-based test of 40 minutes duration.
- Test units compiled systematically to form 6 versions of the test, each of which are randomly assigned to the students.
- A unit of the test composed of a stimulus (e.g. text, table, chart, figures, etc.) followed by a number of related assessment tasks.
  - Feature allows questions to go into greater depth than if each question were introduced with a wholly new context.
  - Allows time for the student to digest the material
  - More time spared for assessing multiple aspects of performance.
- Sample items can be found in the full report in HKPISA Centre's website: http://www.fed.cuhk.edu.hk/~hkpisa/

MAJOR FINDINGS

1. PERFORMANCE OF HONG KONG STUDENTS

- A mean score of 515
- Ranks 4-7th among the 19 participating countries/economies.
- Far below Korea (586), New Zealand (537), and Australia (537).

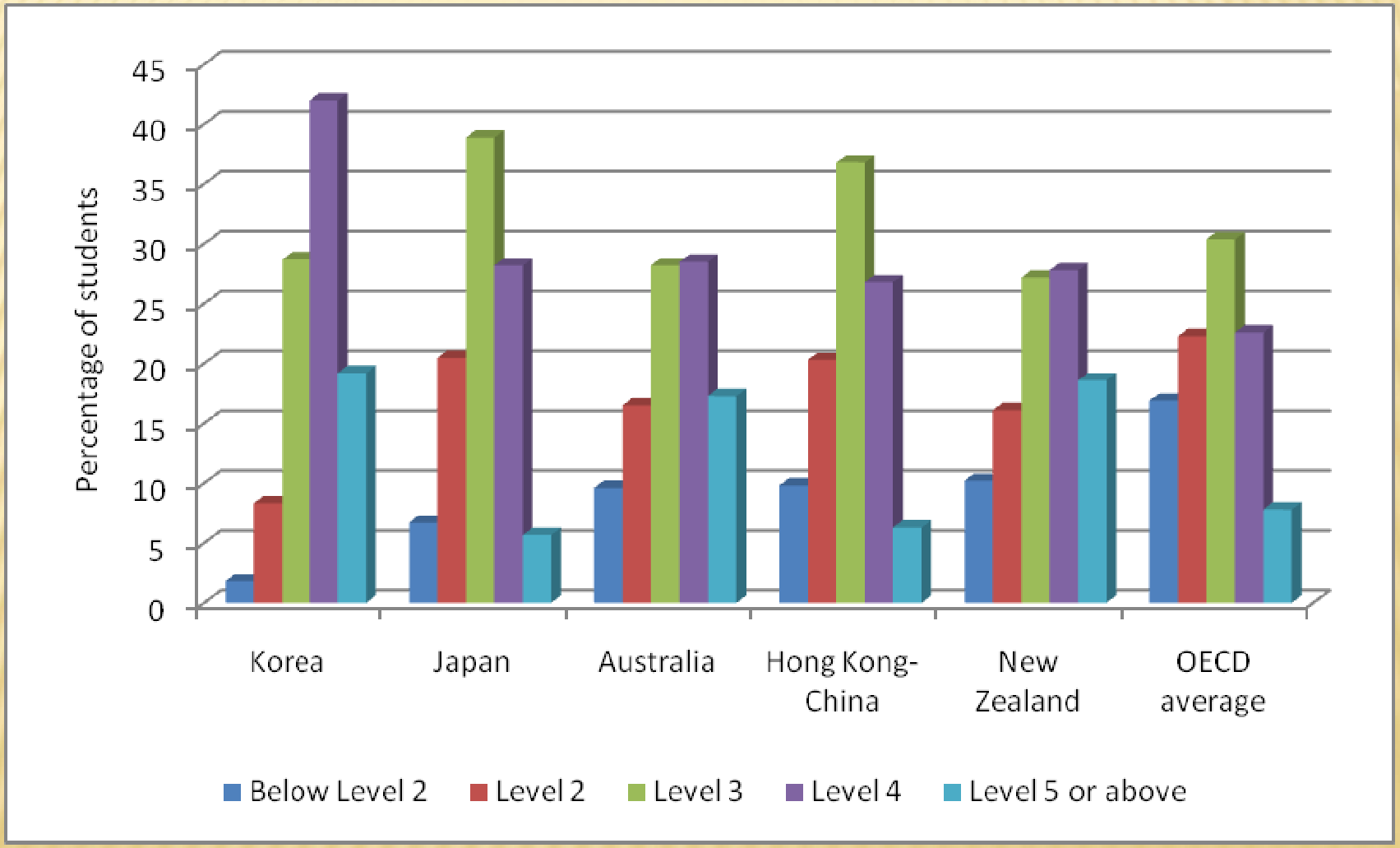
DIGITAL READING PERFORMANCE ACROSS COUNTRIES/REGIONS

Countries/Regions	Mean	S.E.	S.D.	S.E.	Rank	Upper Rank	Lower Rank
Korea	568	(3.0)	68	(1.9)	1	1	1
New Zealand	537	(2.3)	99	(1.8)	2	2	3
Australia	537	(2.8)	97	(1.7)	3	2	3
Japan	519	(2.4)	76	(2.8)	4	4	5
Hong Kong-China	**515**	**(2.6)**	**82**	**(2.3)**	**5**	**4**	**7**
Iceland	512	(1.4)	91	(1.1)	6	5	8
Sweden	510	(3.3)	89	(1.8)	7	5	9
Ireland	509	(2.8)	87	(1.6)	8	6	9
Belgium	507	(2.1)	94	(1.7)	9	7	9
Norway	500	(2.8)	83	(1.5)	10	10	11
OECD average	*499*	*(0.8)*	*90*	*(0.7)*	--	--	--
France	494	(5.2)	96	(7.1)	11	10	13
Macao-China	492	(0.7)	66	(0.8)	12	11	13
Denmark	489	(2.6)	84	(1.3)	13	11	13
Spain	475	(3.8)	95	(2.3)	14	14	15
Hungary	468	(4.2)	103	(2.7)	15	14	16
Poland	464	(3.1)	91	(1.5)	16	15	17
Austria	459	(3.9)	103	(3.9)	17	16	17
Chile	435	(3.6)	89	(1.9)	18	18	18
Colombia	368	(3.4)	83	(1.9)	19	19	19

2. DISTRIBUTION OF PROFICIENCY LEVELS

- 4 levels of digital reading proficiency:
  Level 2 (baseline level), Level 3, Level 4, Level 5 or above (top level)
- Among 16 participating OECD countries:
  - ~ 83.1% students at Level 2 or above
  - ~ 60.7% at Level 3 or above
  - ~ 30.3% at Level 4 or above
  - ~ 7.8% at Level 5 or above
- Level 2 (baseline level): HK students (90.2%) > OECD average (83.1%)
  Level 5 or above: HK students (6.3%) < OECD average (7.8%)
- Hong Kong have to learn from countries with more high achievers:
  Korea (19.2%), New Zealand (18.6%), Australia (17.3%)
- Given basically universal access to computers, policy needs to turn attention from hardware to ensuring effective ICT use for learning.

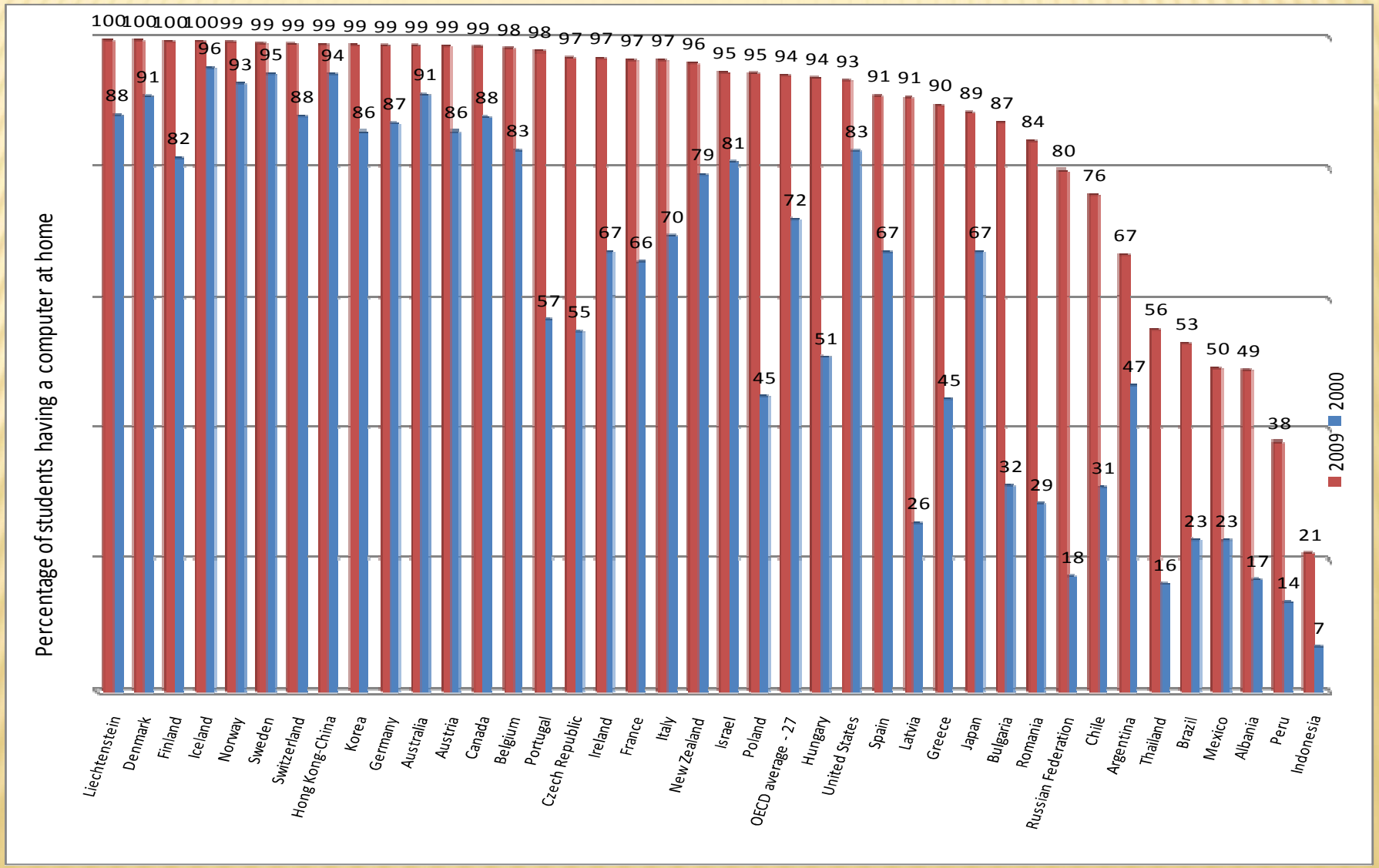
PROFICIENCY LEVELS OF TOP 5



3. ICT ACCESSIBILITY AT HOME

- Almost all 15-year-old HK students have access to computers and the Internet at home.
- During 2000 to 2009, figures improved
  - from 94.5% to 99.0% for computer access
  - from 84.8% to 98.0% for the Internet
- Access to computers at home impacts on digital reading performance significantly.
  - Hong Kong: 61-score-point gap
- Schools should be sensitive to disadvantaged students' ICT need.
- Investigation needed to identify if disadvantaged students cluster within certain schools or communities

ICT ACCESSIBILITY AT HOME



4. DIGITAL DIVIDE BETWEEN SCHOOLS

- Between-school variance in digital reading performance:
  - OECD average: 38%
  - Hong Kong: 46% (> % of 13 participating countries)
- Hardware availability alone does not determine impact on student learning.
- Other factors to explore (e.g., ways of using computers)
- Further investigation:
  - How extending computer use at school contribute to higher standard and greater equality of student performance.
- Question to principals: To what extent lack of ICT resources affect their teaching services?
  - 11.3%: reported shortage of computers
  - 4.0%: reported shortage of Internet access
  - 16.0%: reported shortage of educational software
  - Conclusion: Shortage of ICT resources still affect learning and teaching.

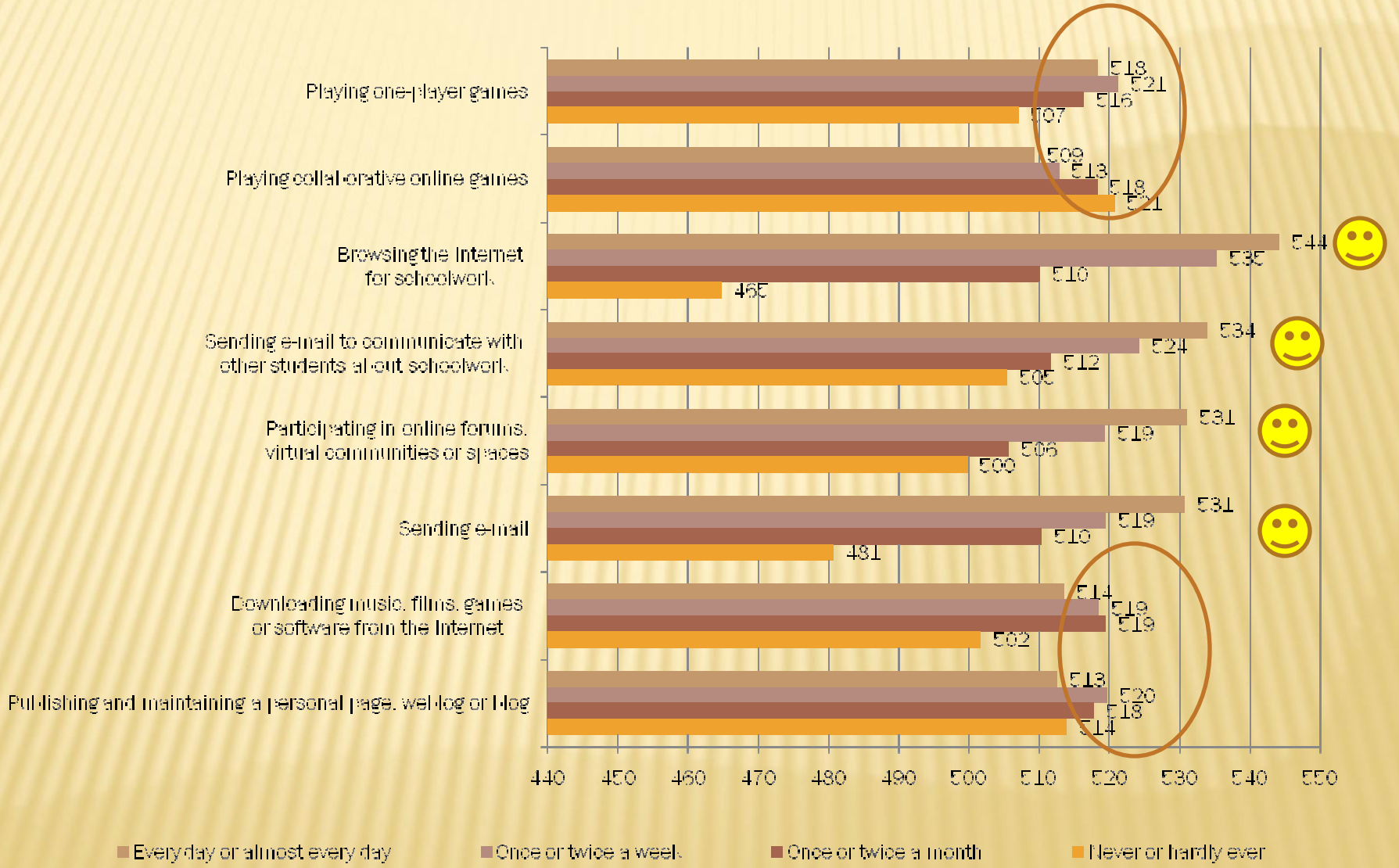
PERCENTAGE OF BETWEEN-SCHOOL VARIANCE IN DIGITAL READING PERFORMANCE

	Within-school variance	Between-school variance	Total variance	% of Between-school variance within countries/regions
New Zealand	5 702	1 350	7 052	19.1%
Japan	6 704	1 676	8 379	20.0%
Iceland	6 123	1 706	7 830	21.8%
Denmark	5 384	1 748	7 132	24.5%
Poland	7 627	2 474	10 101	24.5%
Macao-China	3 484	1 152	4 636	24.9%
Sweden	6 156	2 048	8 204	25.0%
Spain	6 490	2 177	8 667	25.1%
Australia	6 877	2 768	9 645	28.7%
Korea	4 496	1 809	6 306	28.7%
Hungary	6 091	2 628	8 719	30.1%
Norway	3 874	2 303	6 176	37.3%
OECD average	5 456	3 346	8 802	38.0%
Hong Kong-China	**3 993**	**3 327**	**7 320**	**45.5%**
Belgium	4 167	5 900	10 068	58.6%
Chile	4 228	6 107	10 335	59.1%
Ireland	3 800	7 248	11 048	65.6%
Austria	4 121	8 249	12 370	66.7%

5. EFFECTIVE WAYS OF USING ICT AT HOME

- Computer use at home has strongly positive relationship with digital reading performance
- But not all activities contribute equally to student learning
- Contributive activities for HK students (Frequent doers perform better in digital reading):
  - Online forums
  - Email communication
  - Browsing the Internet for school work
- Non-contributing activities (Frequent doers perform slightly worse than moderate doers):
  - Publishing and maintaining blogs
  - Downloading entertainment materials
  - Playing games

EFFECTIVE WAYS OF USING ICT AT HOME



6. IMPROVING THE USE OF ICT AT SCHOOL

- Hong Kong: No significant advantage of using computers at school in digital reading performance
  - Mean score of students with ICT access at school: 516
  - Mean score of students without: 513 (insignificant difference)
- Similarly insignificant findings in 6 other countries/regions, including Korea and Macao
- But significant advantage in 8 other countries: Belgium, Spain, Japan, New Zealand, Iceland, Norway, Sweden and Australia.
- Further investigation:
  - How the 8 countries make good use of ICT in school and how ICT activities beneficial to learning are like?

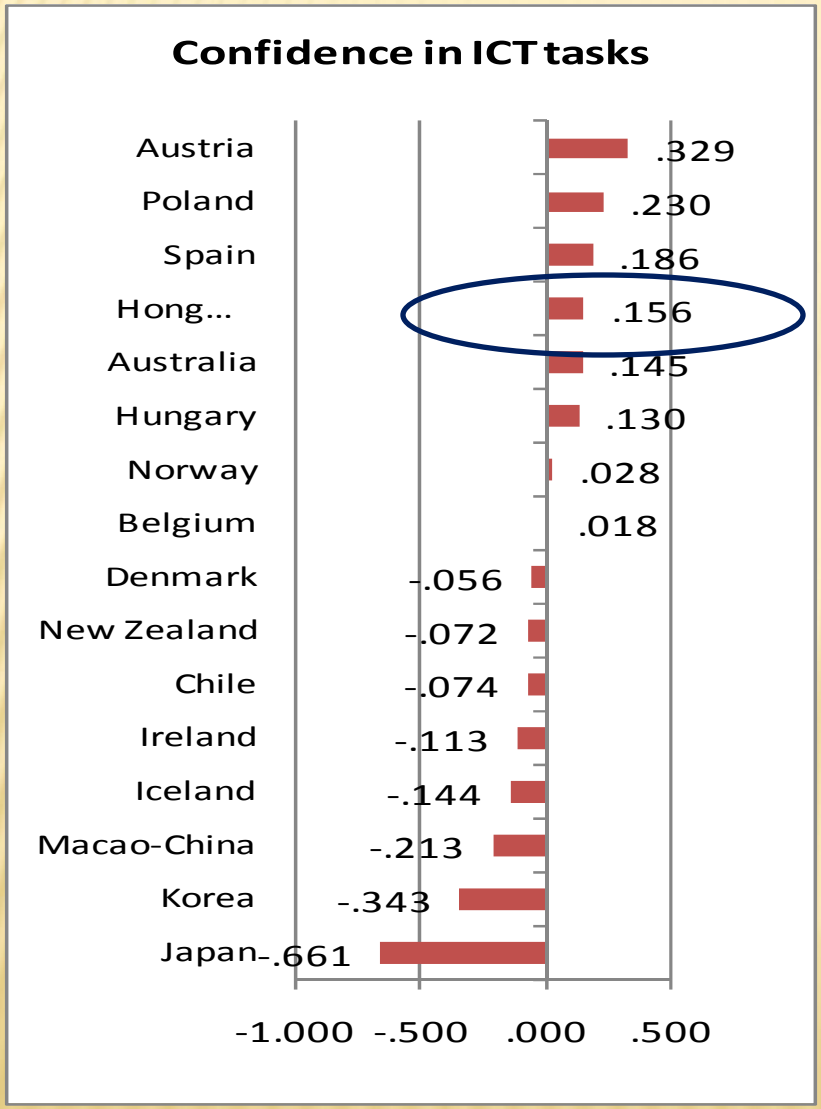
ADVANTAGE AND DISADVANTAGE OF USING COMPUTERS AT SCHOOL

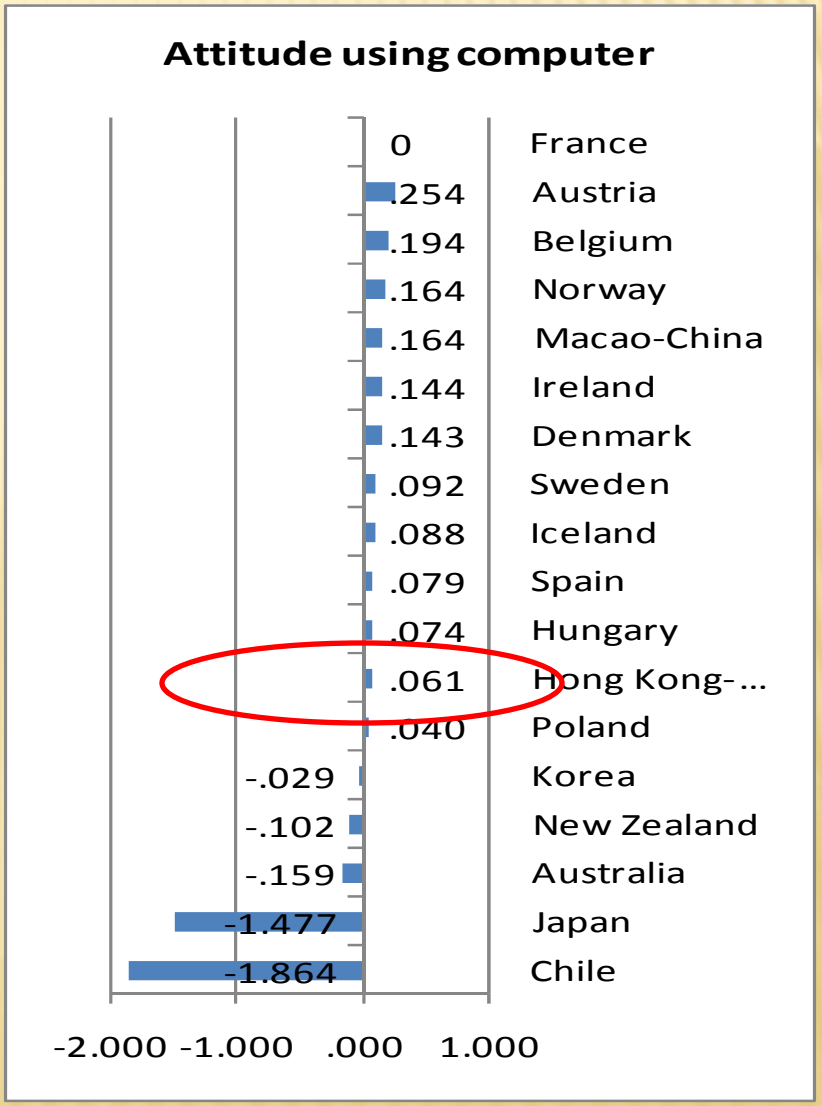
	Students who do not use a computer at school		Students who use a computer at school		Difference in digital reading scores (use - no use)	
	Mean Score	S.E.	Mean Score	S.E.	Score dif.	S.E.
Hungary	488	(5.8)	461	(4.1)	**-27**	(4.8)
Poland	469	(3.9)	461	(3.2)	**-8**	(3.5)
Austria	471	(5.1)	465	(3.9)	-6	(5.4)
Ireland	514	(3.1)	511	(3.3)	-3	(3.2)
Korea	567	(2.9)	569	(3.8)	2	(3.7)
Chile	435	(4.6)	437	(3.6)	2	(4.0)
Hong Kong-China	513	(4.5)	516	(2.6)	3	(4.3)
Macao-China	489	(2.0)	493	(0.8)	4	(2.2)
Denmark	485	(6.2)	491	(2.6)	6	(6.0)
Belgium	509	(3.4)	518	(2.2)	**9**	(3.8)
OECD average	494	(1.2)	503	(0.8)	**9**	(1.2)
Spain	470	(5.1)	481	(3.9)	**11**	(4.7)
Japan	513	(2.9)	527	(2.8)	**14**	(3.6)
New Zealand	525	(4.1)	545	(2.6)	**20**	(4.9)
Iceland	497	(3.9)	519	(1.6)	**22**	(4.4)
Norway	478	(6.3)	503	(2.9)	**25**	(6.0)
Sweden	487	(6.7)	516	(3.3)	**28**	(6.6)
Australia	502	(4.7)	544	(2.8)	**42**	(4.4)

7. ICT CONFIDENCE AND ATTITUDE

- Confidence in doing ICT tasks: HK students > OECD average
- Attitude toward ICT use: HK students ~ OECD average
- Policy factor: Policies underscoring the importance of IT in education since 1997 may have contributed to the positive affective outcomes.
- Regarding hardware provision as a successful first step, the next focus shall be the improvement of software – how to use computers to the best effect on student learning.
- Learning from Korea as a successful case in ICT use:
  - The warning: More is NOT necessarily Better
  - Quality rather than Quantity of ICT use matters - Insofar as benefit of technologies to student learning is concerned.

ICT CONFIDENCE AND ATTITUDE

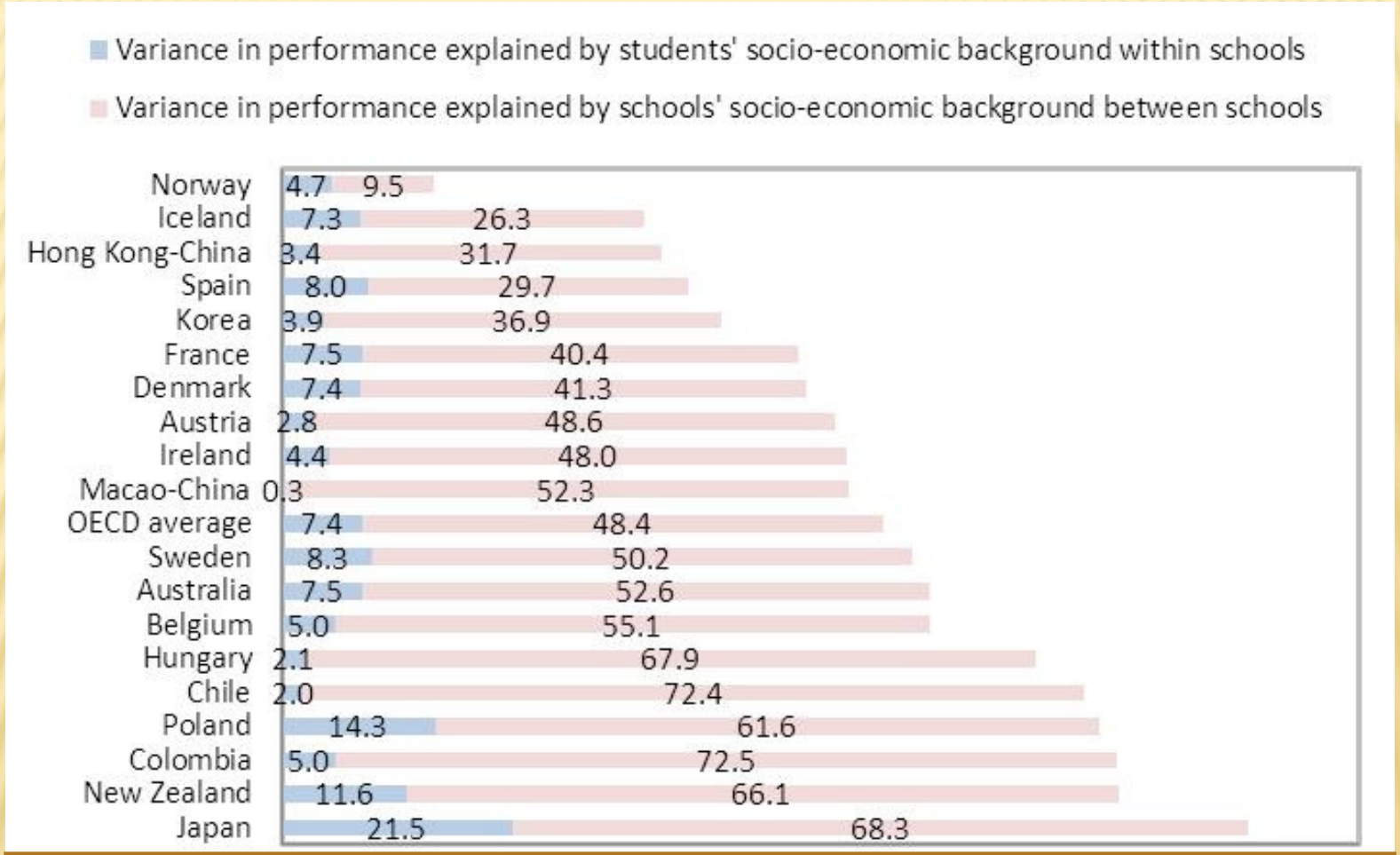




8. MULTI-LEVEL FACTORS RELATED TO DIGITAL READING PERFORMANCE

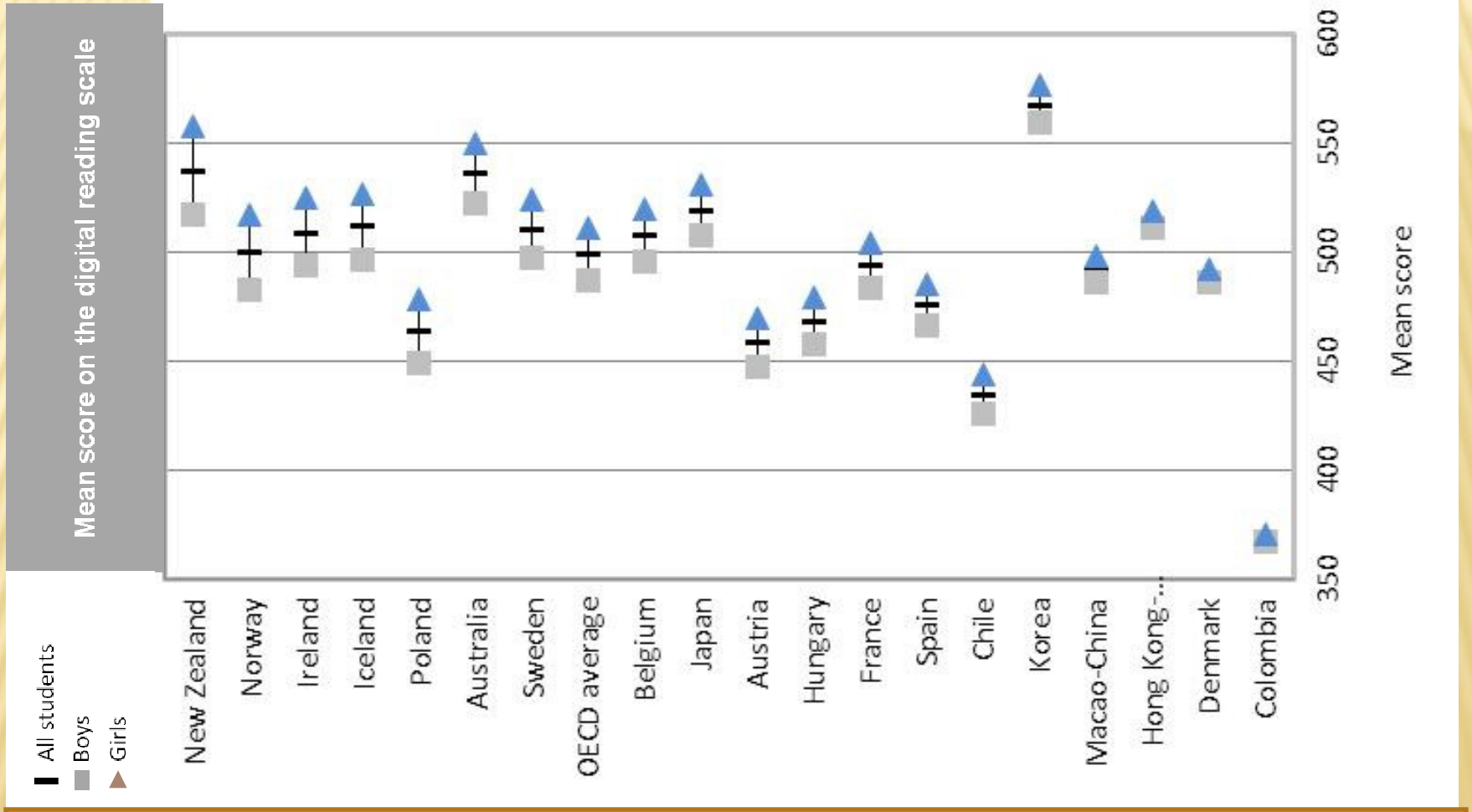
- Disparity in performance can be explained by the factors at various levels:
  - School mean ESCS
  - Reading habit and learning strategies
  - Educational and ICT resource at home
  - Using computer at home for school work or leisure
  - Students' confidence in and attitude towards computer use
- Social segregation between schools has always been a significant problem in the education system of Hong Kong.
- Positive discrimination policies to alleviate social segregation: Extra educational or ICT resource delivered at both school and individual student level.

IMPACT OF ESCS ON DIGITAL READING PERFORMANCE



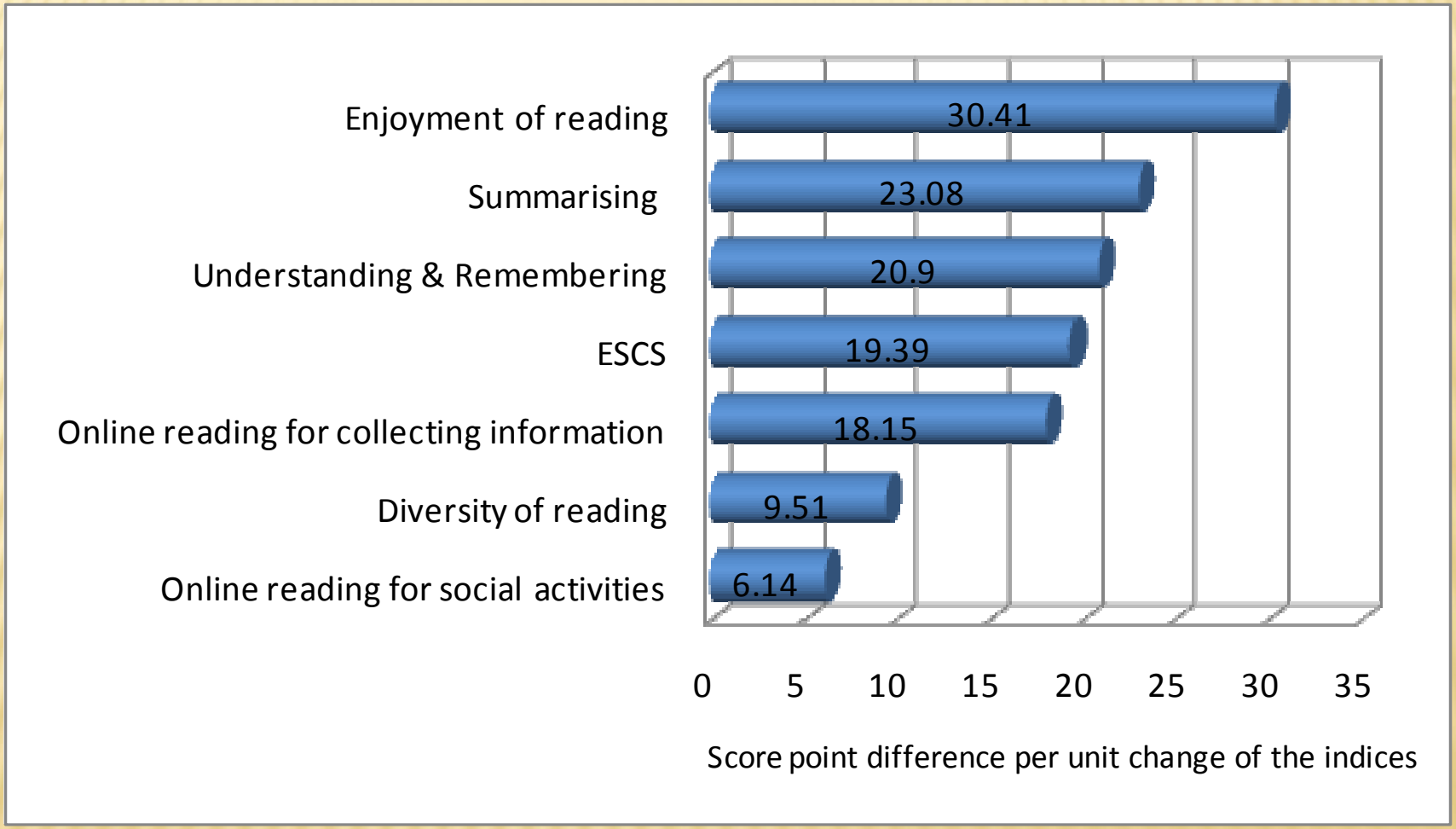
Hong Kong: only 3.4% of the variance in performance are explained by student ESCS but 31.7% are explained by school ESCS.

IMPACT OF GENDER ON DIGITAL READING

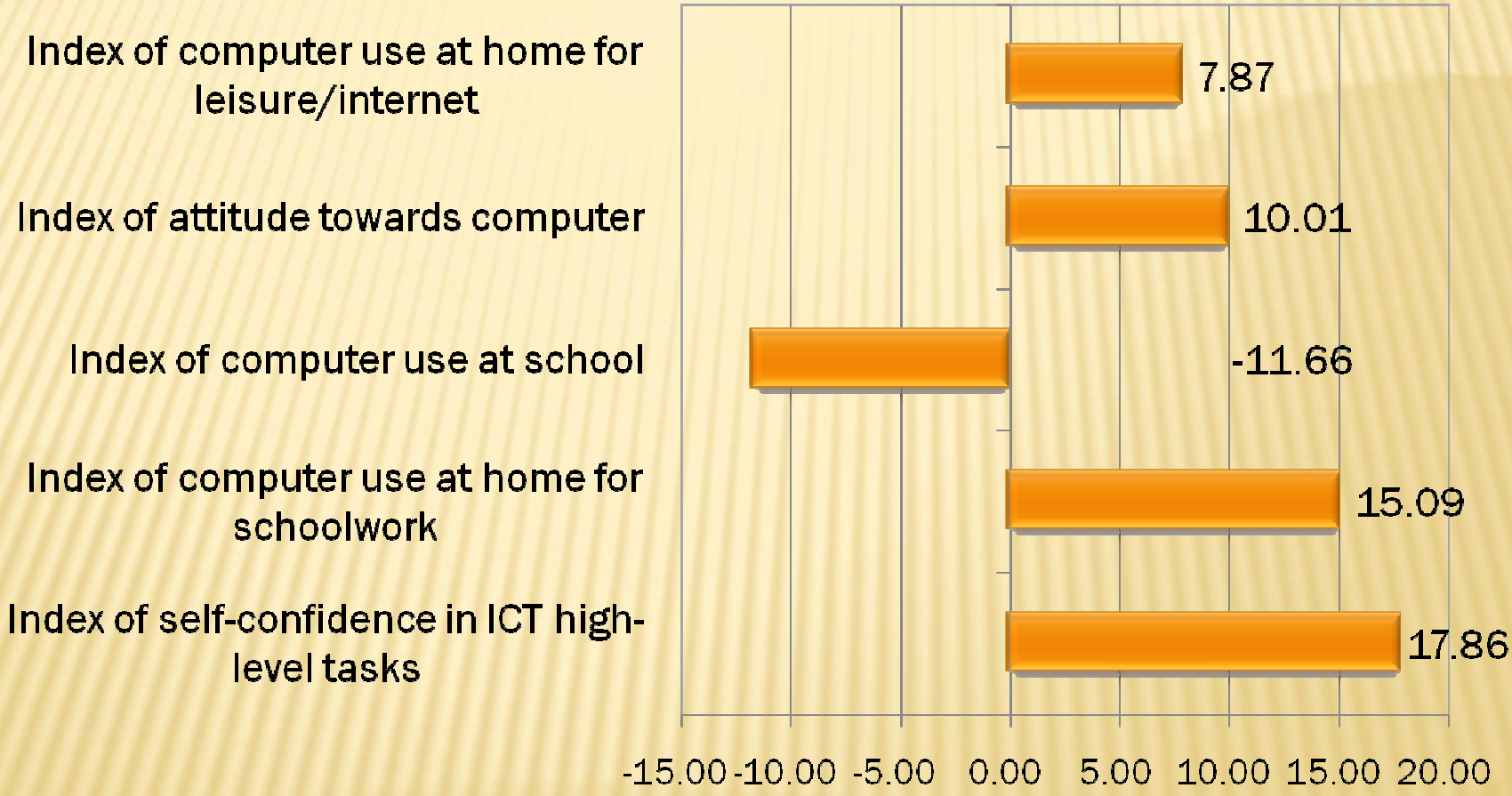


Hong Kong : - Girls outperform boys by 8 score points ;
Gender difference significant statistically;
But much smaller than the OECD average and the other 16 countries.

IMPACT OF READING ENGAGEMENT & STRATEGIES



IMPACT OF ICT RELATED FACTORS



9. FUTURE RESEARCH AND DEVELOPMENT

- Present study focuses on digital reading.
- Foci for future studies: to investigate how ICT related factors impact on learning in other subject areas such as mathematics and science.
- Information about how teachers use ICT in teaching is unavailable in the present study.
- To better understand why using computers at school do not show significant benefit to students in Hong Kong, case study will provide further data and insights regarding the effectiveness of using ICT both at home and at school, especially for the low achievers.

10. QUALITATIVE TRANS-NATIONAL RESEARCH INTO ICT IMPACT ON LEARNING

- International studies should move beyond the present baseline data and give more qualitative insights into ICT use by students and teachers in outstanding countries such as Korea, New Zealand and Australia.
- For the complex phenomenon of ICT use for learning and other purposes simultaneously, qualitative methods should be called into play to delineate the mechanisms or concrete situations where specific learning may or may not occur.
- E.g., comparative study on Korea and Hong Kong;
  - Digital reading score: Korean students > HK students
  - Engagement, ICT confidence & attitude: HK students > Korean students
  - Need to qualitatively study the students in the two societies regarding the pattern and context of ICT use, both at home and in school.

THANK YOU !

Further information

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