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CUHK Releases Results of World's First Study of Students' Digital Literacy in PISA 2009

Living in the information age and the internet world, are Hong Kong students competent in using digital technologies and online information? How do they compare with students in other countries in terms of online reading skills? The Hong Kong Centre for International Student Assessment of the Institute of Educational Research at The Chinese University of Hong Kong (CUHK) released today (28 June) the survey results of digital literacy, as part of the Programme for International Student Assessment (PISA) 2009.

The results of PISA 2009 on students' performance in reading, mathematics and science were released in December 2010. As PISA aims at studying students' ability to apply knowledge in daily life, it incorporated digital reading assessment on top of the conventional written assessment in the 2009 study to tie in with the latest trend. From April to June 2009, about 1,450 students aged 15 from 151 schools were randomly selected for the assessment on digital literacy. The assessment used a computer program designed to simulate online reading environment such as official webpages or search engine webpages, e-mail communications, blogs, online transactions and other interactive platforms. Students were required to answer related questions in 40 minutes.

Survey results

Among the 19 countries and regions participating in the digital literacy assessment, Hong Kong students attained an average score of 515 and ranked fifth (while scores for the fourth to seventh ranks were statistically the same (Figure 1)), lagging behind students in Korea (586), New Zealand (537) and Australia (537). On the scale of digital literacy proficiency levels, level 2 is the baseline while level 5 or above belong to top levels. Results showed that 90.2% of Hong Kong students reached level 2 or above, outperforming the average of 83.1% of the 16 member countries in the Organisation for Economic Co-operation and Development (OECD). However, only 6.3% of Hong Kong students reached the top levels (level 5 or above), lagging behind the OECD average of 7.8%, and the percentage was far below than that of Korea (19.2%), New Zealand (18.6%) and Australia (17.3%) (Table 1).

Information technology resources in schools and families

The study analysed the impact of availability of information and communication technologies (ICT) resources in schools and families on Hong Kong students' performance. A great majority of students (over 98%) had access to computers and internet at school or at home, while 11.3% of schools reported shortage of computers, 4% of schools reported shortage of internet access resources, and 16% of schools reported shortage of educational software. Shortage of these ICT resources was said to have affected teaching quality at

schools. Although the schools possessed comparable ICT resources, the between-school variance in digital literacy was as large as 46%, higher than the OECD average of 38%.

No significant relationship was found between students' computer usage at schools and their level of digital literacy, suggesting that students' digital reading performance may not be enhanced by merely providing schools with computer hardware. As such, education policymakers should ensure the appropriate 'software' is in place to promote the effective use of ICT at schools, thereby enhancing students' performance regardless of their backgrounds. In the family aspect, results showed that students having access to computers at home outperformed significantly those without by 61 score points (518 versus 457 points) in digital reading. In view of the strong negative impact of lack of computers at home on students' learning, the Government should provide support and appropriate ICT resources for students of these families, despite their small number.

Online activities and digital literacy

PISA analysed the relationship between various online activities and digital reading performance. Activities found to be positively correlated with students' performance included participating in online forums, using emails and browsing the internet for completing schoolwork. On the contrary, students who frequently updated their blogs and downloaded entertainment resources had poorer performance (Figure 2).

Compared with students in other countries, Hong Kong students are more confident in and have a more positive attitude towards using information technologies (Table 2), possibly due to the enhanced IT education and related policies in the last decade. However, Hong Kong students have a weaker performance in digital reading compared with students in Korea, New Zealand and Australia, despite their satisfactory basic reading skills and acquaintance with information technology. This is an issue worthy of further study.

About PISA

PISA is a triennial international study organized by OECD with over 70 participating countries. It aims at evaluating the basic knowledge and skills essential for participation in society among students aged 15. The assessment covers three key areas including reading, mathematics and science which are set out by scholars from all participating countries or regions, reviewed by international academic specialists and approved by special commissions of the countries or regions. In the information age, digital technologies will play a more important role in PISA assessment.

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

Press Release – Figures and tables to accompany the press release article

Table 1 Percentage of students at each proficiency level of the digital reading literacy scale

| Countries/ Regions | Below Level 2 | Level 2 | Level 3 | Level 4 | Level 5 or above | Level 2 & above |
|-------------------------------|--------------------------|----------------|----------------|----------------|-----------------------------|--------------------------------|
| Korea | 1.8 | 8.3 | 28.7 | 42.0 | 19.2 | 98.2 |
| Australia | 9.6 | 16.5 | 28.2 | 28.5 | 17.3 | 90.4 |
| New Zealand | 10.2 | 16.1 | 27.2 | 27.8 | 18.6 | 89.8 |
| Hong Kong-China | 9.8 | 20.3 | 36.8 | 26.8 | 6.3 | 90.2 |
| OECD average | 16.9 | 22.3 | 30.4 | 22.6 | 7.8 | 83.1 |

Table 2 Index of self-confidence in ICT high-level tasks and Index of attitude towards computers

| Countries/ Regions | Index of self-confidence in ICT high-level tasks | Index of attitude towards computers |
|-------------------------------|---|--|
| Hong Kong-China | 0.16 | -0.07 |
| Australia | 0.14 | -0.32 |
| New Zealand | -0.07 | -0.26 |
| Korea | -0.34 | -0.18 |
| OECD average | 0.00 | 0.00 |

Figure 1 Digital reading performance of 15-year-old students in PISA 2009

| 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 |
| <i>OECD average</i> | <i>499</i> | <i>(0.8)</i> | <i>90</i> | <i>(0.7)</i> | -- | -- | -- |
| 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 |

Figure 2 Use of computers at home and digital reading performance in Hong Kong

