

## **ISA Research Brief 1**

### **The relationship between age and performance in ISA 2002**

In October 2002 about 3700 students from 42 international schools in 21 countries participated in the International Schools' Assessment (ISA) in Mathematical Literacy, Reading and Writing. The numbers by grade level were around 1200 at Grade 3, 1000 each at Grades 5 and 7, and a little under 500 at Grade 10.

The ISA is administered in English, and is recommended for use in schools where English is the medium of instruction. There were roughly equal numbers of students of English-speaking and non-English-speaking background at Grades 3, 5 and 7, while at Grade 10 there were about twice as many students from a non-English speaking background as from English-speaking backgrounds. .

One of the issues of most concern to schools in the lead-up to the October 2002 administration was the age and stage of students in the nominated grade level. Schools were particularly concerned that younger students might be disadvantaged in relation to older students at the same grade in other schools. For example, some schools were concerned that students at Grade 3 in an American-based school would generally be a year older than students at Year 3 in a British-style school. There was a related concern, that the stage of the academic year at which the tests were administered would vary from school to school, with Southern hemisphere students taking the tests in the second half of their school year, while Northern hemisphere students would be taking the test at the beginning.

In fact, on this second issue, almost all the schools participating in the ISA in October 2002, apart from two Australian international schools, followed the Northern Hemisphere academic year. Thus it can be concluded that the results for the ISA in 2002 represent achievement of students at the beginning of the nominated grade level.

The first issue, regarding age of students in different schools and systems, requires a more detailed discussion.

In any survey across countries, comparing student cohorts is a complex issue. Some studies choose an age-based criterion (for example, the OECD's Programme for International Student Assessment). Others use a grade-based criterion (for example, the IEA studies such as the Third International Mathematics and Science Study and the Performance in Reading Literacy Study). Still others use a "number of years at school" criterion. There are advantages and disadvantages of using each method.

For the 2002 administration of the ISA, schools were advised to administer the assessments to the "named" grade levels – Grades 3, 5, 7 and 10 – regardless of children's ages. This strategy was chosen for practical reasons: it is more difficult for schools to run a test for a selection of children from each grade; and the "number of year at school" criterion presents difficulties of definition: is kindergarten, or prep senior, to be regarded as "school" or not; and with the mobile populations of many schools, it could not be assumed that the present school would be able to collect good information on when each child had started "real" school.

As a guiding set of rules, we used OECD's International Standard Classification of Education (ISCED-97) classification of grades. What we are calling Grade 3 / third grade / Year 3 is the third year of ISCED level 1; what we call grade 7 / seventh grade / Year 7

is the seventh year, counting from the beginning of ISCED level 1. Thus the grade levels are not based on any particular country's age-grade match.

For ISA 2002, we collected information about the age of students at both the trial test and the main administration and found, not surprisingly, that the age of children within each grade level varied quite widely. Table 1 presents the range of ages of students at each grade level for the main assessment in October 2002, divided into 6-month cohorts. The age groups for each year level are labelled from Group 1 to Group 6.

**Table 1 Age range in years and months for each grade level, in six groups per grade level**

		<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>	<b>Group 5</b>	<b>Group 6</b>	<b>total</b>
Grade 3	Age range	<7y6m	7y6m–8y	8y1m–8y6m	8y7m–9y	9y1m–9y6m	>9y6m	
	N	36	107	417	473	188	45	1266
	%	3%	8%	33%	37%	15%	4%	100%
Grade 5	Age range	<9y6m	9y6m–8y	10y1m–10y6m	10y7m–11y	11y1m–11y6m	>11y6m	
	N	27	104	396	357	160	51	1095
	%	2%	9%	36%	33%	15%	5%	100%
Grade 7	Age range	<11y6m	11y6m–12y	12y1m–12y6m	12y7m–13y	13y1m–13y6m	>13y6m	
	N	27	83	303	326	148	47	934
	%	3%	9%	32%	35%	16%	5%	100%
Grade 10	Age range	<14y6m	14y6m–15y	15y1m–15y6m	15y7m–16y	16y1m–16y6m	>16y6m	
	N	21	60	133	155	90	42	501
	%	4%	12%	27%	31%	18%	8%	100%

Table 1 shows that for all four grade levels, the majority of students are within a two-year age range, and in Grades 3, 5 and 7, close to 70% are within one year's range. In our participating international schools, most students are 8 years old in Grade 3; in Grade 5, most are 10 years old; and in Grade 7, most are 12 years old. There is slightly more variation in age at Grade 10; still, over 70% are between 15 and 16 and a half.

Despite this degree of uniformity in grade-age across schools, performance of younger students within a grade level is a legitimate concern for many schools, especially those where the modal age of students in the grade is lower than the international mean. Are students at a younger age disadvantaged in comparisons with others at their grade level?

Figures 1 to 4 show the mean ISA-scale score for each of the four domains reported in the ISA, for each of the six age groups within each grade.

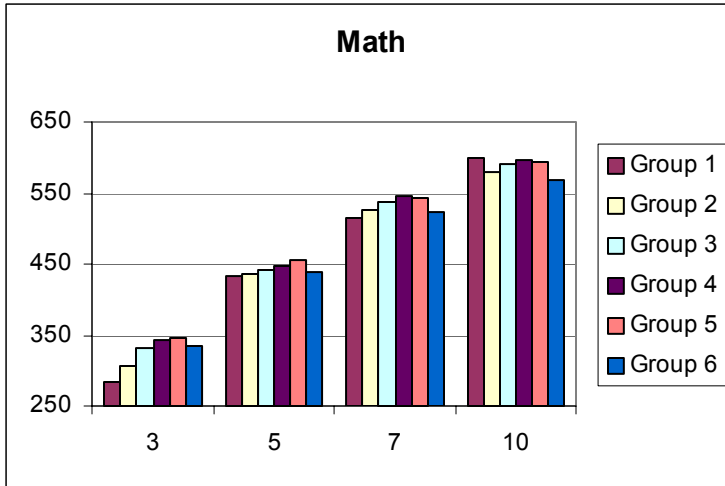


Figure 1 Performance in ISA 2002 Mathematical Literacy by grade and age-group

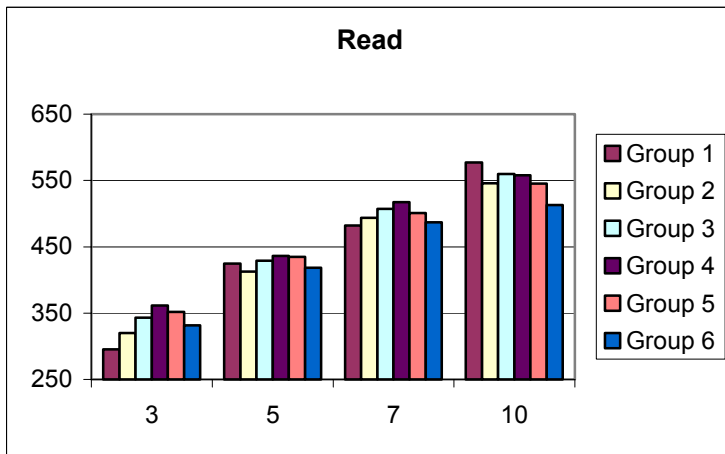
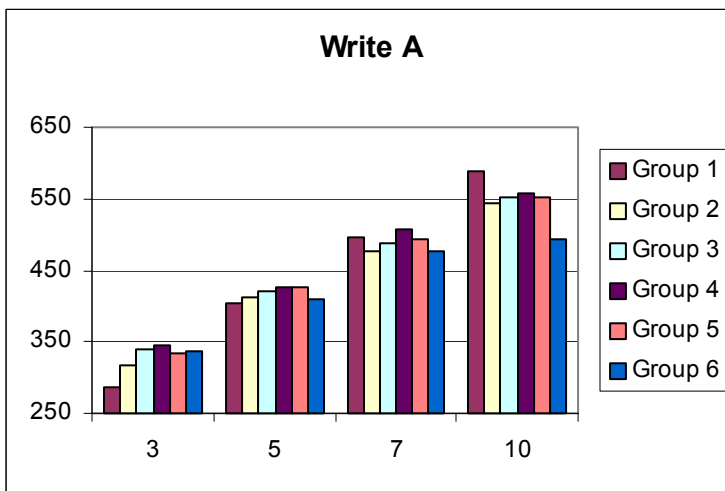
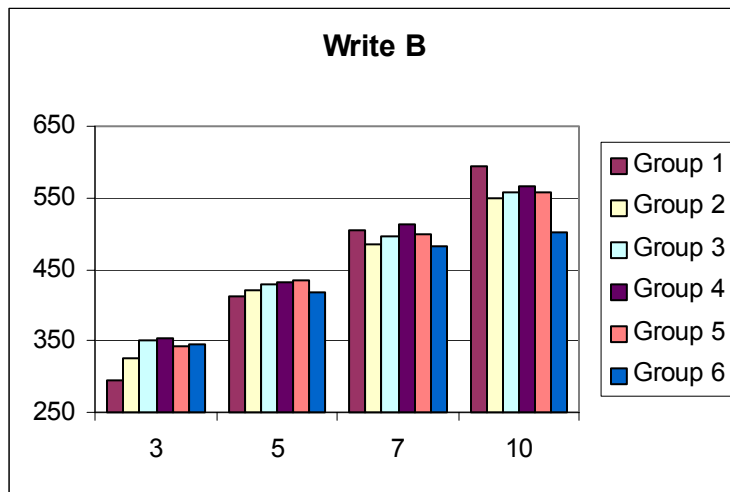


Figure 2 Performance in ISA 2002 Reading by grade and age-group



**Figure 3 Performance in ISA 2002 Writing Task A (Narrative writing) by grade and age-group**



**Figure 4 Performance in ISA 2002 Writing Task B (Expository writing) by grade and age-group**

The pattern across all four domains is consistent within each grade.

The youngest and second-youngest cohorts in Grade 3 performed significantly less well than the older cohorts in Mathematical Literacy, Reading and both Writing tasks, and there was a tailing off of performance for the oldest group.

At Grade 5 and Grade 7, the pattern was less consistent and much less marked, but generally similar, with performance increasing with age up to including the second- or third-oldest group (Group 5) and then dropping off.

By Grade 10 there was virtually no difference in performance of students from Group 2 to Group 5, with the youngest group performing above the level of the other five age-groups.

Group 6, the oldest group, consistently performed less well at all grade levels than the younger cohorts. This may be explained by a practice of retention of students who are under-achieving, or by language or learning hurdles that have prompted schools and parents to enter children at a grade below their peer-group in age. The hypothesis related to language hurdles seems to be supported by the substantially weaker performance of Group 6, the oldest group, in both Writing tasks (Figures 3 and 4) at Grade 10. It should be remembered that there was a larger proportion of non-English speaking background students in Grade 10 than in the younger grades, and in Writing the gap between English- and non-English speaking student performance was, not surprisingly, more marked than in Reading or Mathematical Literacy.

In summary, these data suggest that age difference matters in terms of achievement much more for younger students, and declines in importance to the point of being negligible by Grade 7. It needs to be remembered that numbers of students are quite small, especially in the extreme groups (Groups 1 and 6), and thus the results are not generally statistically significant. Nevertheless the emerging pattern is consistent.

In practical terms, for schools most interested in value-adding, in measuring trends over time in school performance and looking at distance travelled by cohorts and individual

students, the age differences between students at various schools is not of particular interest. On the other hand, for schools that are interested in comparing their students' performance with that of students in other schools, age difference is likely to matter for Grade 3 comparisons and to a lesser extent for Grade 5 comparisons. Therefore any comparative reporting of this kind should include notes about age differences that alert the reader to these research findings.

#### REFERENCES

- Organisation for Economic Co-operation and Development (OECD) (1999).  
*Classifying Educational Programmes: Manual for ISCED-97 Implementation in OECD Countries*. 1999 Edition. Paris: Author.
- De Lemos, Marion & Wright, Judith. (1997). Ages and stages: a guide to class nomenclature. *SET: Research Information for Teachers*, Set One, 1-4.