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RESEARCH SUMMARY

Performance comparison between IB school students and non-IB school students on the International Schools' Assessment (ISA) and on the Social and Emotional Wellbeing Questionnaire

Based on a research report prepared for the IB by:

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Project overview

The International Baccalaureate (IB) aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. The IB offers a continuum of international education for children between the ages of 3 and 19 years. The Primary Years Programme (PYP) is designed for students aged 3 to 12; the Middle Years Programme (MYP) serves students aged 11 to 16; and the Diploma Programme (DP) is a challenging two-year curriculum, primarily aimed at students aged 16 to 19. It leads to a qualification that is widely recognized by the world's leading universities. Currently, the IB works with more than 3,000 schools in 140 countries to offer IB programmes to more than 900,000 students.

In 2009 the IB commissioned ACER (Australian Council for Educational Research) to report on how PYP and MYP students at international schools worldwide performed on the ISA (International Schools' Assessment) relative to non-IB students in 2007–2008 and 2008–2009. The ISA assesses student performance in grades 3 to 10 across four domains: *Math Literacy, Reading, Narrative Writing* and *Expository Writing*. The assessment asks both multiple-choice and open-ended questions, and provides international normative information about student performance. The Reading and Mathematical Literacy domains are based on the internationally endorsed frameworks of the OECD's Programme for International Student Assessment (PISA). On the whole, despite some regional differences, the results indicated that IB PYP and MYP students outperformed their non-IB peers on the ISA across all four domains in a majority of grade levels, with the strongest effects noted in grade10. IB students' ISA scores in grades 9 and 10 also compared very favourably to PISA benchmarks in Math and Reading. On the other hand, there was insufficient evidence to suggest that IB schools that are authorized for a longer period produce better student outcomes, and no clear patterns were noted across IB full continuum schools and single or dual programme schools.

The IB again commissioned ACER to undertake a follow-up study to further document student performance on the ISA as well as investigate perceptions, attitudes and well-being of IB students. Phase II is based on students who participated in the ISA in 2009–2010 and 2010–2011, and has three components: a replication of Phase I using more recent data, a closer examination of particular findings from Phase I and an analysis of a student questionnaire on perceptions, attitudes and well-being. This summary highlights major findings from the research study. Among the multiple analyses appearing in the report, this summary focuses on: student performance on the ISA and the PISA benchmark analysis; performance of IB continuum schools compared to single or dual programme schools; and the values and attitudes, perceptions of school life and social and emotional well-being of students who completed the *Student Learning and Wellbeing Questionnaire*.

Sample design

In 2009–2011, 270 of the 290 schools that participated in the administration of the ISA were willing to be identified for the purpose of this study. A total of 117 PYP, 86 MYP and 161 DP schools were designated as authorized programmes. The IB cohort is defined at grade level, and consists of students in grades 3 to 5 in authorized PYP schools, and/or grades 6 to 10 in

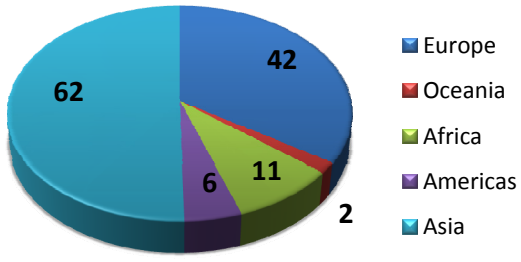
authorized MYP schools. The non-IB cohort consists of schools (or students in schools) with no authorized IB programme in that year level. In 2009–2011, a total of 50,714 international students participated in the ISA, of which 68% were IB students (Table 1). There were a total of five geographic regions: Asia, Europe, Africa, Americas and Oceania (Figure 1). Because there was only a small number of schools in the regions, the data from schools in Oceania were combined with Asia, and the data from schools in Americas were combined with Europe. Thus, the results were reported for three geographic regions: Asia and Oceania, Europe and Americas and Africa.

Table 1. IB and Non-IB schools and students distribution by grade.

	Number of schools		Number of students	
Grade	IB	non-IB	IB	non-IB
3	96	90	6,647	2,927
4	62	78	3,831	2,009
5	99	88	6,960	2,597
6	44	79	3,201	2,039
7	64	60	4,944	2,023
8	48	51	3,704	1,601
9	50	49	3,411	1,717
10	30	35	1,992	1,111
Total	n/a*	n/a*	34,690	16,024

* Total number of schools is not applicable because each school may have more than one grade.

Figure 1. Authorized IB school distribution by region.



Summary of key findings

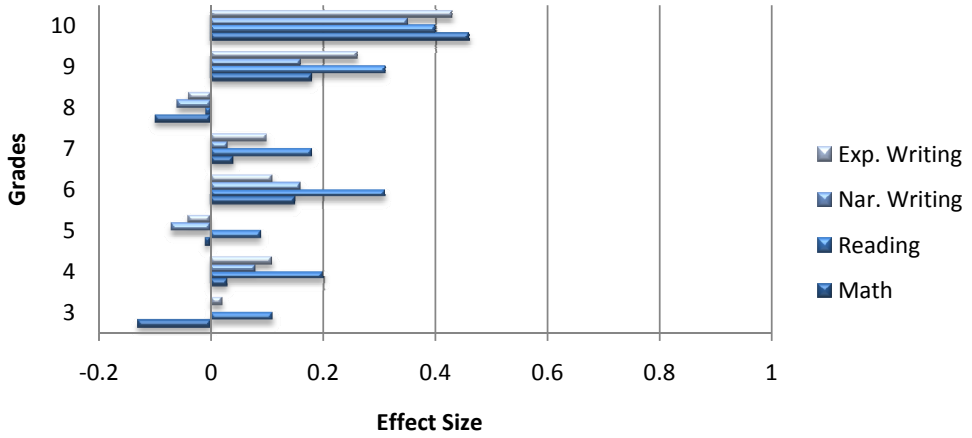
International Schools' Assessment

Overall, the results suggest that PYP and MYP students performed better than the non-IB students on all four ISA assessment domain areas. Specifically:

- In Mathematical Literacy, IB students had statistically significant higher mean scores than the non-IB students in grades 6, 9 and 10, while statistically significant lower mean scores in grades 3 and 8. The effect size is small at grades 3, 6, 8 and 9, and medium at grade 10.
- In Reading, IB students had statistically higher mean scores than the non-IB students in all grade levels except grade 8, which showed no significant difference between the two groups. The effect sizes were small at grades 3, 5 and 7, and medium at grades 4, 6, 9 and 10.
- In Narrative Writing, IB students had a statistically significant higher mean score than non-IB students in grades 4, 6, 9 and 10. The effect size was small at grades 4, 6 and 9, and medium at grade 10. However, the mean score in grade 5 for IB students was statistically significantly lower than the mean score for non-IB students, but the effect size (-0.07) was negligible. There was no significant difference found in grades 3, 7 and 8.
- In Expository Writing, IB students achieved significantly higher mean scores than the non-IB students in grades 4, 6, 7, 9 and 10. The effect sizes were small at grades 4, 6 and 7, and medium at grades 9 and 10. There was no significant difference found in grades 3,5 and 8.

It is worth noting that the largest positive effect sizes in all assessment domain areas were seen at grade 10, the final year of the MYP (Figure 2).

Figure 2. Effect size of difference in performance between IB and non-IB students by grade.



In the Europe and the Americas region, IB student performance was equal to or better than the non-IB students in all four domains at all grade levels with only one exception, which was Narrative Writing at grade 8. In Africa, 75% of comparisons showed that IB students

significantly outperformed non-IB students. In Asia and Oceania, IB students outperformed non-IB students in: grade 10 Mathematical Literacy; grades 4, 6, 7, 9 and 10 Reading; grades 4, 9 and 10 Narrative Writing; and grades 4, 7, 9 and 10 Expository Writing. However, in the Asia and Oceania region, non-IB students scored significantly higher than IB students in Mathematical Literacy in grades 3 to 5 and 8, with small to medium effect sizes.

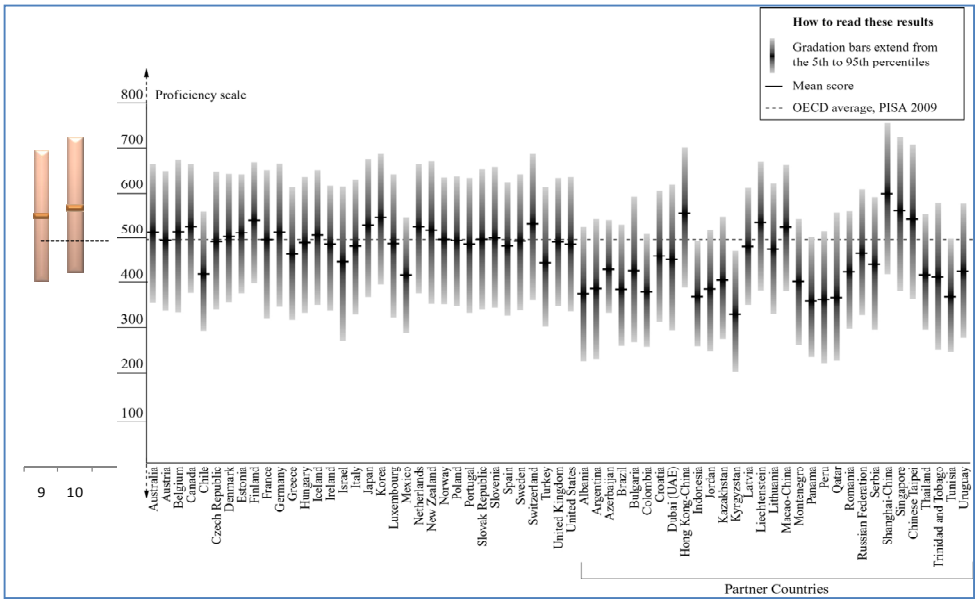
Multilevel analysis indicated that the proportions of between-school variance among IB schools were smaller than those among non-IB schools in all of the four ISA domains. This showed that the IB schools were more similar to each other than the non-IB schools were similar to each other, with respect to the four domains of ISA performance.

PISA benchmark analysis

The second analysis examines how the Grade 9 and Grade 10 ISA scores of IB students aligned with PISA benchmarks. Results indicate:

- IB students' ISA means were all significantly higher than the PISA means in both Mathematical Literacy and Reading.
- In Mathematics, the average PISA score of OECD countries was in the range 419 to 546, and the average of partner countries was in the range 331 to 600. The average IB scores were 551 and 570, in grades 9 and 10 respectively. IB students in both grades performed better than the OECD mean (ie effect sizes in the range of 0.53 to 0.90), and better than any individual OECD country (Figure 3).
- In Reading, the average scale scores of OECD countries was in the range of 425 to 539, and the average PISA score of partner countries were in the range of 314 to 556. As the average scale scores of IB students were 533 and 568 in grades 9 and 10 respectively, IB students performed better than most of the PISA countries' means.

Figure 3. IB schools grades 9 and 10 performance in Mathematical Literacy compared to OECD and partner countries.



Continuum school performance

The second component of the study includes the analysis of performance in IB continuum schools compared to single or dual programme schools. The results indicate:

- IB students from the schools with a continuum programme outperformed the students from the schools with no IB programmes in all domains at grade 10, in Reading at grades 4 and 6 to 10, and in Mathematical Literacy in grades 9 and 10. The students with no IB programmes did better than students at continuum schools in Mathematical Literacy at grade 3, Narrative Writing at grade 5, and Expository Writing at grades 3 and 5.
- IB cohorts at schools with the continuum of programmes were more likely to outperform their counterparts with single (or double) programme where year-level appropriate IB programme was not implemented at the same grade levels, and students at schools with both PYP and MYP were more likely to outperform their counterparts with only a single programme implemented.

Student Learning and Wellbeing Questionnaire

The last component is an analysis of students completing the primary (grades 5 and 6) and secondary (grades 9 and 10) years *Student Learning and Wellbeing Questionnaire* focusing on student values and attitudes, perceptions of school life and their social and emotional well-being. The four dimensions of questions in the primary years questionnaire include: Student and Teacher Interaction; Social Connectedness; Personal Development Outcome; and Study Engagement. The seven dimensions of questions in the secondary years questionnaire include: Student and Teacher Interaction; Social Connectedness; Deep Learning; Surface Learning; Personal Development Outcome; Academic Outcome Orientation; and Learning Goals.

High proportions of agreement across all dimensions were observed among IB PYP and MYP students. A comparison of IB students and non-IB students show the following:

- In the primary years questionnaire, IB students had a moderately higher proportion of agreement across all four dimensions (Table 2).
- In the secondary years questionnaire, IB students had a slightly higher proportion of agreement in Social Connectedness and Deep Learning in both grades, and in Personal Development Outcome and Academic Outcome Orientation at grade 8. However, non-IB students had a slightly higher proportion of agreement in Student and Teacher Interaction and Learning Goals at both grades and in Personal Development Outcome and Academic Outcome Orientation at grade 9 (Table 3).

Table 2. Comparison of percentage of agreements between IB and non-IB in grades 5 and 6.

Dimensions	Grade	Agreement (%)			Disagreement (%)		
		IB	non-IB	difference	IB	non-IB	difference
Student and Teacher Interaction	5	88.6	86.2	2.4	7.5	9.8	-2.3
	6	87.3	85.3	2.0	9.8	10.1	-0.4
Social Connectedness	5	82.9	81.3	1.7	11.8	14.0	-2.1
	6	83.9	81.2	2.7	11.8	14.0	-2.2
Personal Development Outcome	5	87.3	85.3	2.0	8.4	10.7	-2.3
	6	87.6	84.1	3.5	8.3	11.4	-3.1
Study Engagement	5	83.4	80.7	2.6	11.5	14.1	-2.6
	6	83.5	79.0	4.5	12.1	15.6	-3.5

Table 3. Comparison of percentage of agreements between IB and non-IB in grades 8 and 9.

Dimensions	Grade	Agreement (%)			Disagreement (%)		
		IB	non-IB	difference	IB	non-IB	difference
Student and Teacher Interaction	8	80.3	80.4	-0.1	17.2	17.1	0.1
	9	79.4	79.7	-0.3	17.5	16.5	1.0
Social Connectedness	8	83.7	81.5	2.2	11.7	12.8	-1.1
	9	82.9	81.4	1.4	12.7	13.3	-0.6
Deep Learning	8	80.2	79.6	0.6	16.3	16.3	0.0
	9	79.1	78.7	0.5	16.9	17.3	-0.4
Surface Learning	8	56.4	56.1	0.3	39.4	39.4	0.0
	9	55.5	57.1	-1.6	39.6	37.9	1.7
Personal Development Outcome	8	85.2	84.0	1.2	10.4	11.2	-0.8
	9	83.3	84.2	-0.9	11.1	11.1	0.0
Academic Outcome Orientation	8	79.7	78.6	1.1	15.3	15.2	0.1
	9	79.8	81.0	-1.2	13.7	14.9	-1.1
Learning Goals	8	83.9	84.6	-0.7	10.3	9.4	0.9
	9	82.7	85.9	-3.3	10.4	10.0	0.4

An additional analysis examined the relationship between students' ISA performance and their perceptions, values, attitudes and dispositions. There were only weak correlations found between students' ISA performance and their perceptions, values, attitudes and dispositions pertaining to school, teacher and learning.

Conclusion

This investigation on ISA assessment data in 2009–2010 and 2010–2011 indicated that there was evidence that at a global level, PYP and MYP students generally performed better than students from non-IB schools in the ISA assessment areas. In the 32 comparisons (8 grades by 4 domains), only 3 groups of non-IB students—grades 3 and 8 Mathematical Literacy and grade 5 Narrative Writing—performed better than their IB peers. The IB cohort outperformed the non-IB cohort with a relatively large margin in the regions of Europe, the Americas and Africa for most comparison groups, and 9th and 10th grade IB students achieved average scores in Mathematical Literacy and Reading that were significantly better than the PISA OECD means.

The comparisons of ISA performance between a continuum programme and a single (or dual) programme indicated that IB cohorts with a continuum programme were more likely to outperform their counterpart with a single (or double) programme where a year-level appropriate IB programme was not implemented at the same grade levels. There was evidence to suggest that IB cohorts with PYP and MYP were more likely to outperform their counterpart with only a single programme implemented, again, at grade levels where a year-level appropriate IB programme was not implemented.

Both IB and non-IB students responded with a relatively high percentage of agreement on their perceptions of school life, their attitudes and their sense of well-being. However, IB students had moderately higher proportions of agreement across all four dimensions in the primary years questionnaire, and slightly higher proportions of agreement in Social Connectedness and Deep Learning at grades 8 and 9, and in Personal Development Outcome and Academic Outcome Orientation at grade 8 in the secondary years questionnaire.

This investigation was conducted with limited background information about schools and students. ISA performance data were not census data, and schools participating in each country were not a random sample. Caution must be exercised in drawing conclusions from these results. In the comparison of the outcomes of students, cohort performances or country performances, there were many other factors, such as students' social economic backgrounds, school size, school type, the numbers and qualifications of teachers in a school, sources of funding and any selective enrolment policies among others that may influence student performance to some extent. No data concerning these factors were collected and therefore were not available for this analysis.

This summary was developed by the IB Research Department. A copy of the full report, prepared by the Australian Council for Education Research is available here at http://www.ibo.org/research. For more information on this study or other IB research, please email research@ibo.org.

To cite the full report, please use the following:

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