International Supplement

Two of the three major international comparison research projects – PIRLS and PISA – were published in late November and early December and in this international supplement we bring you detailed reports on these two programmes and analysis of these and some other international surveys.

This supplement is a collaborative effort from NFER's leading researchers and some of our most experienced journalists.

Media coverage of PISA in particular has been largely inaccurate, as we report in the media page. This is partly because these major international research programmes are vast and complex, while journalists on daily newspapers have only a few hours to read and analyse them and limited space for their reports. While the headlines about PISA reported the UK's fall down the international league tables, this was neither true nor the real story. As Ian Schagen, Head of Statistics at NFER, explains below, you cannot compare the UK's performance over time with the PISA data (though you can compare England and Scotland over time with PIRLS.) On other hand, the evidence PISA in particular contained about the impact of various policies on student performance went largely unreported. Some of the evidence from PISA may be unwelcome news for some politicians, as we report, but it has little to do with places in league tables.

Mike Baker looks at the McKinsey report *How the World's Best-performing School Systems Come out on Top*, which was produced by a team led by Sir Michael Barber, as well as the OECD's *Education at a Glance 2007*. While Baker looks at schools, John O'Leary covers *Education at a Glance* from a higher education perspective. We have brief reports from Australia, New Zealand and the USA. To round off our international supplement, Martin Rogers reports on his recent visit to China.

What all these reports show is that there are things we can learn from what is happening around the world, but the data is complex. There is evidence that policy makers should be guided by, though that evidence will not always be welcome.

This supplement was written by Mike Baker, Demitri Coryton, Michael Marshall, John O'Leary, Martin Rogers and, from NFER, Jenny Bradshaw, Ian Schagen and Liz Twist.

Comparisons over time in PISA

Dr Ian Schagen
Head of Statistics, NFER

PISA scores aim to do several jobs, including comparing countries' results with each other at the latest time point, and comparing each country's performance with results from previous surveys. Unfortunately, doing both is not as easy as it seems. In each survey there is one major subject and two minor subjects – in 2006 the major subject was science and the minor ones reading and mathematics. Scores in the minor subjects are derived to try to maintain the same standards as when they were major subjects (2000 for reading, 2003 for mathematics), but based on only a small subset of test items held the same from year to year which are given to a minority of pupils in the survey.

For these reasons performance in these minor subjects over time is liable to fluctuations, and comparisons of results in reading from 2000 to 2006 or in mathematics from 2003 to 2006 may be misleading. The major subject in 2006, science, was tested with a whole lot of new items and a new scale generated from scratch, so comparisons with previous scores are not even theoretically possible.

In England's case, these issues are compounded by the fact that in 2000 our results were deemed only marginally acceptable relative to the sampling criteria and in 2003 we failed to meet the criteria. Our 2006 results are regarded as robust, but OECD have agreed that comparisons with earlier results should not be published, mainly due to uncertainties surrounding those earlier results.

Background

There are three major international surveys, used by governments around the world to compare attainment at various points in the education system.

PIRLS is the Progress in International Reading Literacy Study, conducted every five years since 2001, and assessing the reading literacy skills of 10-year-olds. England and Scotland participate separately in PIRLS; Northern Ireland and Wales do not participate.

PISA is the Programme for International Student Assessment and has been conducted every three years since 2000. This focuses on students' skills in maths, reading and science as they approach the end of compulsory schooling (aged 15) and the focus is rotated in each survey. In 2006 the focus was science. Each of the four home nations participates in PISA. OECD reports results for the UK as a whole.

TIMSS is the Trends in Mathematics and Science Study. This assesses pupils aged 10 and 14, and is conducted every four years. The most recent survey was in 2007 and it will report in December 2008. England and Scotland participate separately in TIMSS; Northern Ireland and Wales do not participate.

PIRLS and TIMSS are conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA) and PISA under the auspices of the OECD. Each study includes a different combination of countries and a few countries leave and more join for each new survey.

The National Foundation for Educational Research is the national centre for all three surveys.

It's all about the teachers

INTERNATIONAL SUPPLEMENT

Mike Baker

"It's the economy, stupid". That was the slogan that reminded Bill Clinton to focus on what really mattered on his way to victory in the US presidential race in 1992.

So what is the equivalent in education? As countries continue the search for the Holy Grail of educational standards, what is the magic formula for raising standards? Is it money? Or are class sizes, national testing, comprehensive admissions policies, or greater market freedoms the key?

These crucial questions face all governments as they look beyond national boundaries for ideas to boost their competitiveness through education. Comparative studies like PIRLS and PISA provide important clues but they are usually enigmas wrapped up in riddles, requiring persistent sleuthing by researchers before they will reluctantly produce any hints about desirable policy outcomes.

However, for comparative data on different education systems, there is no better place to start than the OECD's *Education at a Glance, 2007*. It shows that, on a range of different performance indicators, the same few countries do consistently well: Finland, Korea, Canada, and Japan.

PISA

The same few keep popping up in the OECD's 3-yearly PISA reports, which compare standards amongst 15-year-olds in reading, maths and science. Korea, Finland and Hong Kong are in the top five for both reading and mathematics. Canada, New Zealand, Taiwan, and Japan also rank consistently high. It is a bit like the Premiership: the same few effectively make a mini-super league of their own.

So how do they do it? What are the common educational factors across these very different countries? An obvious place to start is with money. According to *Education at a Glance*, the countries that spend the most per student are: the USA, Switzerland, Norway, Austria, and Denmark. So where are the top achievers? Well Japan is 8th, Finland 14th, New Zealand 21st, and top-scoring Korea right down at 22nd.

So if money is not the key factor, what about class size? Well, unfortunately for solution seekers, there is no neat correlation between small classes and high standards. Korea and Japan are both in the top three for large class sizes at both primary and lower secondary level education.

Like Indiana Jones, we must plunge on. Perhaps the amount of time pupils spend in the classroom is the answer? Top of the international league tables for total hours taught are: Italy, Netherlands, Australia, and New Zealand. So, that includes a couple of the high-performing systems. Yet, hang on a minute, look at those with the shortest hours: Finland, Slovenia, Norway, Sweden and Korea. In short, no clear pattern here either.

McKinsey & Company

So where does this leave us in the search for our Holy Grail? Well, stuck in the undergrowth and in need of a trusty guide. Enter McKinsey & Company's recent report: *How the World's Best-performing School Systems Come out on Top* (2007). The McKinsey team was led by Sir Michael Barber who, as adviser to David Blunkett and then Tony Blair, was behind most of the big school reforms in England since 1997.

The McKinsey study links quantitative results with qualitative insights into common characteristics of the highest achieving education systems. It quickly dismisses any direct link between results and system-wide reform or spending levels. The USA, it notes, increased education spending by 73 per cent between 1980 and 2005. It also cut class sizes and launched numerous initiatives. Yet academic results stayed stubbornly the same.

So, having dismissed any direct correlation between results and cash, what does the McKinsey report conclude? Its answer is very simple: it is all down to the quality of the teachers. The case is persuasive. The McKinsey report found that the one common characteristics of top-performing school systems was that they all recruited their teachers from the top cohort of university graduates through a highly rigorous and competitive recruitment process. Thus in Korea teachers are recruited from the top five per cent of graduates and in Finland from the top ten per cent.

The report found that high-achieving education systems have a strong national screening system for applicants before they even apply for teacher training. So in Finland, the first round of national screening includes a multiple-choice examination to test numeracy, literacy and problem-solving skills. The top scoring candidates are then passed onto a second round of selection run by the universities. Then, after graduation, there is a further screening process, involving more tests, implemented by schools before they hire new teachers.

Rigorous selection process

In Singapore, which scored highly in the PIRLS study, applicants are screened, tested and selected before they enter teacher training and are then formally employed by the Ministry of Education and paid a salary during their training. The McKinsey report argues that this rigorous selection process, and the fact that only the brightest graduates get past the first hurdle, is one reason why teachers have a high status in these countries. This creates a virtuous circle: high status means more competition, leading, in turn, to a higher quality intake.

The McKinsey report also argues that, having recruited the best teachers, a good school system must also define what great teaching looks like and ensure that teachers keep renewing their skills through professional development. This includes sending expert teachers into the classrooms to help other teachers to improve and encouraging all teachers to learn from one another. So, in Japan and Finland, it is standard practice for teachers to work together, planning lessons jointly and observe each other's teaching.

The McKinsey report makes fascinating reading. It also makes it sound so simple. It should be on every policy-maker's Christmas stocking list. As Bill Clinton's spin-doctor might have said: "It's all about the teaching, stupid."

International comparisons

INTERNATIONAL SUPPLEMENT

John O'Leary, Editor of *The Times Good University Guide*

There's nothing like a set of international comparisons to undermine a few educational certainties. In the past month, the Organisation of Economic Co-operation and Development's annual *Education at a Glance* and, to a lesser extent, the Higher Education Policy Institute's report on the student experience have both performed this service.

Whenever national education performance is compared, cultural and systemic differences (not to mention the age of some statistics) make total accuracy a pipedream. But the trends are real enough – and this year's included some genuine surprises in higher education and elsewhere.

Who would have thought, at the height of last year's panic over the closure of university chemistry departments and the apparent slump in take-up of science courses generally, that the UK would appear at the top of the OECD league for the proportion of scientists among those graduating? And how does the fact that the UK spends more than any other OECD government on pre-school education tally with the growing clamour for a step change in budgets for nurseries?

True, many of the science graduates are overseas students, but the last two years have seen what looks like the start of a sustained recovery in applications for degree places across the range of science subjects. Perhaps some of the evangelising in schools has had an effect. Perhaps top-up fees concentrate minds that might otherwise have been lured into so-called 'soft' subjects. Whatever the reason, there may have to be some rethinking of the Government's rescue mission for strategic and supposedly vulnerable subjects.

There already is some rethinking of pre-school strategy after a series of reports casting doubt on the effectiveness of the Government's Sure Start programme. No one is yet suggesting cutting the funding for nursery schools, but the lazy assumption that every problem in the education system can be solved by throwing money at the under-fives should now be questioned. Much of what takes place in nursery education is relatively cheap; much of higher education (especially in the sciences) is unavoidably expensive. That is not to deny the pivotal importance of pre-school education, but to seek a rational division of resources.

Education at a Glance usually has good things to say about UK higher education – the participation rate has been rising and the proportion of students completing courses is generally at the top end of the scale. With a selective entry system and degrees that are at least a year shorter than in most OECD countries, the completion rate ought to be good. In fact, the UK's lead on this indicator was beginning to slip this year and there were warnings from the Paris secretariat that other countries were overtaking on participation. And, as the report put it: "In tertiary education, a below-average increase in spending in the UK did not match the below-average increase in student enrolment."

> **"A UK degree is still worth more in the labour market than in most countries – only the Czech Republic, Ireland, Hungary, Portugal and the United States have bigger earnings differentials between graduates and non-graduates."**

A UK degree is still worth more in the labour market than in most countries – only the Czech Republic, Ireland, Hungary, Portugal and the United States have bigger earnings differentials between graduates and non-graduates. Yet fewer 15-year-olds than in most OECD countries – only a shockingly low 32 per cent – expect to go to university. More than that actually do go already, and the Government wants 50 per cent to have experienced higher education by the time they are 30.

Quite why aspirations are so low, when the tangible rewards are relatively high, remains a mystery. Universities have spent increasing amounts of time and money on outreach programmes, often targeting children much younger than 15, trying to attract socio-economic groups that remain under-represented in higher education. There are new bursaries (many of which lie unclaimed) for those from less affluent homes. John Denham, the Secretary of State for Innovation, Universities and Skills, has dropped dark hints that the vice-chancellors may not get the rise they seek in top-up fees unless they succeed in broadening the intake further. But the best that ministers can come up with is to insist that every academy and trust school should link with a university.

HEPI

Whatever it is that is putting teenagers off higher education, it shouldn't be the workload, according to the HEPI report on the student experience. Born out of concern at the low level of teaching time at many universities, the report actually purports to measure the total amount of time students spend working. That, inevitably, is a less exact science than simply counting lectures and seminars, since it relies on self-reporting over an extended period. Hence, it would appear that medical students at Sheffield University or Queen Mary, University of London, work 15 hours a week less than those at Keele or Durham. In a subject where the curriculum is similar from university to university, that is surprising, to say the least.

Even more surprising, perhaps, is the finding that UK students in general work much shorter hours than their Continental counterparts. When the length of degree is taken into account, the difference becomes embarrassing. Are European universities spoon-feeding their students unnecessarily, are British students more honest about their work habits, or is there really a serious discrepancy? The steady trail of American and Asian students coming to British universities does not suggest that their courses are seen as a soft option. They remain far ahead of their Continental rivals in global rankings. It may be that on this occasion, something was lost in translation.

Media watch

Media wrong on PISA

INTERNATIONAL SUPPLEMENT

The headlines about the Organisation for Economic Cooperation and Development's Programme for International Student Assessment (PISA) report were universally bad. "British pupils falling in world rankings" said *The Times*. "Billions spent on education, but schools slump in the world league" was the headline in the *Daily Mail*. "Reading and maths standards falling in Britain, says OECD" was the more restrained headline in the Independent. The *Daily Telegraph* was far blunter. "UK's education record plummets". At the other end of the political spectrum the *Guardian* said much the same: "Britain slumps in world league table for maths and reading". The tabloids were even crueler: "Dunce Brits slump", said the *Daily Star*. The BBC website reported that "UK schools slip down global table". The *Spectator* which, as a weekly, had more time to analyse the data than the dailies, also got it wrong, claiming that "the OECD study on education, the most comprehensive in the developed world, showed standards for British 15-year-olds actually falling between 2000 and 2006".

'Dramatic fall'

In its editorial the *Daily Telegraph* observed that "according to objective international tests, UK school children have now fallen dramatically in the global table of standards for reading and maths" and concluded that the OECD's PISA research directly contradicted the Government's examination programme, which showed an ever-improving level of achievement. "Not only has the quality of British schooling been declining, but there seems to have been an official policy of concealing that fact by lowering national examination standards."

The editorial in the *Independent* took a similar line. "The evidence paints a worrying picture of sliding educational performance." It made comparisons between the PISA ranking in 2000 and 2006 and what appears to be the contradictory evidence of rising standards over the same period as measured by SATS, GCSEs and A-levels.

Yet all these reports painted a false picture, for PISA did not show Britain plummeting down the international league table. The results were actually quite good for the UK, as our report in this issue, produced by NFER, shows. So how did the media get it so wrong? The first PISA survey was in 2000. The British data was not really robust enough to be included, but it would have been an embarrassment for both the OECD and the British government if the UK had not made the grade for inclusion. The criteria were therefore stretched and the British figures were included. British data for the following survey, in 2003, was even worse and this time the UK was left out.

Not interested in PISA

The problem was with the schools, which had 15-year-olds studying for GSCEs. These were hugely important for the students and for the schools and their position in league tables. The schools were not interested in doing PISA tests, which were of no benefit to them. The result was that not enough schools participated in 2000 or 2003. For 2006 the DfES went to great lengths to persuade schools to participate. Extra funding and support was offered. This had the desired effect and the number of schools participating went up, and by enough to compensate for poor take-up rates in Scotland where the Scottish Executive had not offered any extra inducements and where the number of schools participating was lower. The English results were able to compensate because the OECD only works on the basis of nation states and it was therefore the UK-wide total that counted.

PISA is a huge piece of research, published this year in two volumes covering over 700 pages of statistics and tables, with more available on the web. It is complex and difficult to analyse. There are serious lessons to be learned and failures in English policy, but the real story is not about falling down international league tables. As we explain in our international supplement, the poor quality of data in 2000 and 2003 means that we really don't know what has happened over the last six years. In science the methodology has changed and it is not possible to compare with previous years for any country.

So why did the media focus on league tables when they were not the real story? A week before the report was published the rankings for 2006 were leaked to a Spanish newspaper. The OECD then published the tables on their own. The full report was published a week later, though nearly all the daily papers were not represented at the London press conference where it was launched. This was held at 3.00 pm to allow senior OECD officials to attend the press conference in Paris in the morning, before travelling to London for mid-afternoon. But 3.00 pm was too late for daily paper deadlines. Their journalists therefore accessed the report from the OECD website, where it was posted at 9.00 am and skipped the London press conference where senior officials, including the director of the Education Directorate of the OECD, no less, were available to answer questions.

Eurovision

While the media were obsessed with the rankings of countries, treating the whole thing as an educational version of the Eurovision song contest, papers ignored another health warning on the OECD media briefing material. The results for many countries were so close that statistically the margin of error was greater than the difference between a country and a number of those ranked just above and below it. The OECD called this the confidence interval. For the UK, this confidence interval meant that Britain might have come anywhere from 8th to 12th among OECD countries, and not necessarily 9th. This technical detail did not appear anywhere in the media coverage.

Perhaps the best analysis in the daily press was by Professor Alan Smithers in the *Daily Telegraph.* He pointed out that with high-stakes tests such as those in England, teachers had a big incentive to teach to the test that resulted in a distortion. There was no such incentive with OECD tests, which were therefore a fairer reflection of achievement. He pointed out that the UK's PISA score in 2006 was not so different from that in 2003 and was about the same as our main European competitors. While the 2006 figures were worse than those for 2000, it was the 2000 figures that were inaccurate and out of line with previous studies. Yet new Labour grasped the 2000 results as evidence of the success of their policies. As Smithers observed, "Brown is hoist with Blair's petard and has some explaining to do."

PISA – Global lessons for UK policy

INTERNATIONAL SUPPLEMENT

The PISA 2006 survey contains evidence that policy makers in the UK can draw on, illuminating the effects of policy options on existing and future policy in the different jurisdictions of the UK. Some of the evidence will be unwelcome to some policy makers, as it challenges long-held beliefs that owe more to ideology than evidence. For example, selection into different types of school by ability has a negative impact on a school system, as does streaming. Policies of choice and diversity have a negative impact on equity. However, the Government's children agenda is supported by evidence from PISA.

This article looks at policy implications for the UK based on evidence from the global picture that the PISA survey of 400,000 students in 57 countries provides. The performance of the four home countries of the UK in PISA is analysed by Jenny Bradshaw in a separate article.

The PISA survey looked at the effects of selection between different types of school and also within schools. It looked at the effects of policies of choice and diversity on both standards and equity. The conclusions are similar to those of the 2000 and 2003 PISA surveys. This means that whether the effects of policies on school systems are measured primarily on reading ability, maths or science, the results are the same.

The latest PISA survey found that selection into different types of school based on ability, such as that which forms the basis of secondary education in Germany, Northern Ireland and parts of England, has a negative impact on the education system, depressing the performance of the system overall. It is beneficial to those young people who go to selective schools, which, as would be expected given their intake, perform above average, but it depresses performance in the schools that those not selected for academic education attend. As with all previous PISA surveys, the latest one found that the greater the degree of differentiation of type of school in a system, the poorer the system as a whole performs. Barbara Ischinger, director of the OECD Directorate for Education, speaking at the London press conference to launch the latest PISA report, confirmed that selection between schools on the grounds of ability has a negative impact on school systems. This is the same message that Andreas Schleicher, the German director of the PISA programme, gave after both the previous PISA reports.

The result of selection within schools depends on the type of selection used. Streaming into different ability bands has a negative impact on most children and on the system as a whole, while setting has a positive one. When Barbara Ischinger was asked by *Education Journal* what the effects of mixed-ability teaching were on an education system, she had to admit that the OECD did not know. The data to answer the question existed, but it had not been analysed.

Socio-economic background

PISA 2006 confirms what is already widely known, that home background influences educational performance. National research in a number of countries has tended to show that schools reproduce existing patterns of privilege. The PISA research shows something different. The 2007 report states: "While all countries show a clear positive relationship between home background and educational outcomes, some countries demonstrate that high average quality and equity in educational outcomes can go together."

Examples of countries in the 2006 survey that showed both above-average performance in science and a below-average impact of socio-economic background on performance were Australia, Canada, Finland, Japan and South Korea from the OECD, plus Hong Kong, Macao and Estonia. Countries that managed the opposite, with below average performance in science and an above average impact of socio-economic factors, included the USA, France, Turkey, Portugal, Argentina and Brazil.

PISA looked at the performance of private schools as well as those in state systems. While private schools performed better, once the socio-economic background of their students was factored in, private schools then performed slightly worse than those in the state sector.

Choice and diversity

Policies of choice and diversity are being pursued by a number of countries. PISA 2006 confirmed the trend that many other OECD reports have done, that there is a price to be paid in equity for giving parental choice. The OECD published a report in the summer focused entirely on equity in education systems and PISA 2006 confirms the conclusions of that report.

In terms of diversity of provision, the degree of diversity is an important factor in determining the impact on an education system. If the diversity is based on academic selection then it has a negative impact on the system. The impact on quality is much less marked if, as in England, most types of school are comprehensive. Sweden, which has followed policies of reform designed to increase parental choice, is fully comprehensive. The negative impact there has been on equity rather than quality.

> **"The report on PISA 2006 concludes that countries can achieve both high standards of quality and equity, and a few have already done this."**

Those countries, like Finland and Canada, which manage to achieve a very low level of difference of performance between schools find far less demand from parents for choice, as parents can be confident that they will find good quality whatever school their child attends. The greater the variation in performance between schools the stronger the demand for choice, which itself leads to policies that increase inequality between schools. Choice has a price that is paid in equity.

The report on PISA 2006 concludes that countries can achieve both high standards of quality and equity, and a few have already done this. Improving quality and equity requires a long-term view and a broad perspective. In a conclusion that chimes with the objectives of the British Government's Children Plan and the *Every Child Matters* agenda, the OECD states that achieving the twin aims of high quality and equity may mean "taking measures to safeguard the healthy development of young children or to improve early childhood education" and "socio-economic reforms that enable families to provide better care for their children…it may mean efforts to increase socio-economic inclusion and improve school offerings".

PISA in the UK

INTERNATIONAL SUPPLEMENT

Jenny Bradshaw
Principal Research Officer, NFER

The Programme for International Student Assessment (PISA) is a survey of educational achievement organised by the Organisation for Economic Co-operation and Development (OECD). PISA assesses students aged fifteen on their competence to address real life challenges involving reading, mathematical and scientific literacy. The aim is to investigate how well young people are equipped for adult life, rather than just their mastery of school subjects.

PISA is carried out on a three-year cycle. The first PISA study was in 2000 (supplemented in 2002), and this was repeated in 2003 and 2006. The survey was undertaken in 43 countries in the first cycle (32 in 2000 and 11 in 2002) and 41 countries in the second cycle (2003). In PISA 2006, the third cycle, 57 countries participated, including all 30 OECD members. The main focus for PISA 2006 round was science, with reading and mathematics as minor domains. The next PISA survey will be in 2009 and will focus on reading.

Mathematics and reading were 'minor domains' in the PISA 2006 survey. This means that not all students were assessed in these subjects, and that the questions did not cover the subjects as fully as in science which was the major domain. The results reported for mathematics and reading are estimates for the whole population, based on the performance of students who were presented with test items in each subject. These estimates take into account information about how students with specific characteristics performed. These scores therefore give a 'snapshot' of performance rather than the fuller more rigorous assessment which is available for science. Both the international report and the national reports for England, Wales and Northern Ireland focus mainly on science: scores in the science tests, and information about attitudes to science and science activities from school and student questionnaires.

The National Foundation for Educational Research became involved in the PISA study for the first time in PISA 2006 in England, Wales and Northern Ireland and will be carrying out the study in all four parts of the UK

Table 1: Mean scores for science overall

	Mean	England	N. Ireland	Scotland	Wales
England	516		*NS*	*NS*	▲
Scotland	515	*NS*		*NS*	*NS*
Northern Ireland	508	*NS*	*NS*		*NS*
Wales	505	▼	*NS*	*NS*	

▲ = significantly higher ▼ = significantly lower NS – no significant difference

Table 2: Percentages at PISA science levels

	below level 1 %	levels 1-6 %	levels 2-6 %	levels 3-6 %	levels 4-6 %	levels 5-6 %	level 6 %
England	*5*	95	83	62	36	14	3
Scotland	*7*	93	80	59	35	14	3
Northern Ireland	*4*	96	85	61	33	13	2
Wales	*5*	95	82	58	31	11	2
OECD Average	*5*	95	81	57	29	9	1

Table 3: Mean scores of males and females in science

	Overall mean score	**Mean score of males**	**Mean score of females**	**Difference**
England	*516*	521	510	**11***
Scotland	*508*	509	507	2
Northern Ireland	*515*	517	512	4
Wales	*505*	510	500	**10***
OECD Average	*500*	501	499	**2***

* statistically significant difference

Table 4: Mean scores for mathematics

	Mean	England	Northern Ireland	Scotland	Wales
England	506	NS	▲		▲
Scotland	495		NS	NS	▲
Northern Ireland	494	NS		▼	NS
Wales	484	▼	NS	▼	

▲ = significantly higher ▼ = significantly lower NS – no significant difference

Table 5: Percentages at PISA mathematics levels

	below level 1 %	levels 1-6 %	levels 2-6 %	levels 3-6 %	levels 4-6 %	levels 5-6 %	level 6 %
England	*6*	94	80	55	29	11	2
Scotland	*7*	93	77	54	31	12	3
Northern Ireland	*4*	96	84	60	32	12	3
Wales	*6*	94	78	51	23	7	1
OECD Average	*8*	92	79	57	32	13	3

in PISA 2009. The United Kingdom has taken part in PISA since it began in 2000, but has struggled to satisfy the rigorous participation requirements which are necessary in an international survey. In PISA 2000, the UK fell short of these requirements, but OECD decided that it was not clear that bias was present as a result of this shortfall. The UK was therefore included in the international report. In PISA 2003, both school and student response were short of that required and the decision was made that the UK could not be included in the international results. In both cases, the problem was mainly in England, where many schools were reluctant to take part.

In PISA 2006, the UK achieved its highest response ever for both schools and students and fully satisfied the OECD's requirements for participation. Therefore, in PISA 2006 the UK has a fully representative sample for the first time. PISA 2006 was also the first time that all four parts of the UK took part in PISA. In previous studies Wales had participated only in proportion to its share of the UK population, which meant that only a very small number of Welsh schools took part and it was therefore not possible to report separate PISA results for Wales.

"Because of the previous sampling problems and the possibility of resulting bias in the results, the PISA 2006 results for the UK should not be compared with those from previous PISA surveys."

The decision has been made by OECD that, because of the previous sampling problems and the possibility of resulting bias in the results, the PISA 2006 results for the UK should not be compared with those from previous PISA surveys. Therefore, the 2006 PISA results represent a baseline against which future surveys can be compared. It will be very important to build on the success achieved in PISA 2006 in achieving a good representative sample of schools and students. This will make it possible to take full advantage in future of the rich information generated by the study and to track changes over time with more confidence.

The combined UK result which is reported in the international OECD report is based on all parts of the UK but is weighted according to population. This means that England, which has about 80% of the UK population, makes the largest contribution to the UK result. However, all four constituent nations of the UK sampled more schools and students than needed for the international UK result, and were thus able to report their results separately.

Student achievement in Science

The United Kingdom's attainment in science was encouraging. The mean score was significantly above the OECD average and only seven countries had scores which were significantly higher than the UK. The UK was also well represented at the highest levels. There are six science levels in PISA, with level 6 being the highest. Only two countries (Finland and New Zealand) had a higher proportion at this level. However, balancing these high achievers were a relatively large proportion of low achievers.

Table 1 summarises the mean scores for each of England, Wales, Northern Ireland and Scotland for science. Performance was relatively consistent across the UK, with few significant differences in terms of overall achievement. The one exception was that England's mean score was significantly higher than that of Wales.

Distribution of performance in science

The United Kingdom had a wide distribution of ability in science compared with many other countries – ie although there were students achieving very highly, there was also a substantial 'tail' of low achievers.

Looking at the four parts of the UK separately, Northern Ireland had the widest distribution of attainment. Table 2 shows the cumulative proportions at each level. It also shows the average proportions in OECD countries.

Northern Ireland has the most students below level 1, and more than the OECD average, while the other parts of the UK have fewer than the OECD average at this level. At the other end of the scale, England and Northern Ireland have the most students at PISA level 6 and Wales has the least, but all have more than the OECD average. At the top two levels, all parts of the UK are above the OECD average. Wales has the fewest students at these two levels, however, with 11 per cent compared with 14 per cent in England and Northern Ireland and 13 per cent in Scotland.

Gender differences in science

There were differences between the four parts of the UK, in terms of the achievement of males and females in science. Table 3 shows the mean scores for each country for males and females and highlights differences which were statistically significant.

In just over a third of the 57 countries participating in PISA, one gender performed significantly better than the other. The direction of those differences was split, with nine countries where males did better and 12 where females did so. The OECD average showed a slight advantage for males and this was mirrored in England and Wales, where males significantly outperformed females. There were no statistically significant gender differences on the overall science scale in Northern Ireland or Scotland.

"In just over a third of the 57 countries participating in PISA, one gender performed significantly better than the other."

In both Wales and England, the gender difference in the overall science score was mainly due to differential performance in one aspect of PISA: the *Explaining phenomena scientifically* scale which is mainly concerned with science knowledge. This was also true for most participating countries, including Scotland and Northern Ireland: typically, males outperformed females on this scale. On two other scales, *Identifying scientific issues* and *Using scientific evidence* there was less gender difference.

Student achievement in mathematics

The UK's attainment relative to other countries was less encouraging for mathematics than it was for science. Twenty countries had mean scores which were significantly higher than that of the UK. The score for the UK was not significantly different to the average score for OECD countries.

The highest attainment for mathematics was in Scotland, followed by England and Northern Ireland. The mean score for Northern Ireland was significantly lower than that for Scotland. The lowest attainment was in Wales, and the mean score for Wales was significantly lower than that for Scotland and England.

Distribution of performance in mathematics

The distribution of performance in mathematics in the UK was not as wide as for science. The largest gap between

the highest and lowest achievers was again in Northern Ireland, and the smallest in Wales.

Table 5 shows the cumulative percentages of students at each of the six levels of mathematics attainment, along with the percentages below level 1.

Scotland has the lowest percentage at the lower levels of attainment but the proportions at the highest levels are similar in England, Northern Ireland and Scotland, with all three close to the OECD mean. Wales has the lowest proportion at the higher levels, with only 23 percent at the highest three levels compared with 32 per cent in Scotland.

Gender differences in mathematics

Table 7.3.5 shows the mean scores of males and females, and the differences in their mean scores.

The differences between males and females were statistically significant in England, Scotland and Wales but not in Northern Ireland. The difference in score points between males and females was similar in England, Scotland and Wales and this was above the OECD average.

Student achievement in reading

The UK was similar to the OECD average in reading. A total of eleven countries have significantly higher scores. The three highest scoring countries for reading were Korea, Finland and Hong Kong.

The highest attainment for reading was in Scotland, followed by England and Northern Ireland. However, the differences between these three countries were not significant. The lowest attainment was in Wales, and the mean score for Wales was significantly lower than the other three parts of the UK.

Distribution of performance in reading

Table 8 shows the cumulative percentages of students at each of the five PISA levels of reading attainment, along with the percentages below level 1. This shows that the widest spread of achievement was again in Northern Ireland which had a slightly higher proportion than England and Scotland at the top two levels, but also a higher proportion below level 1. Scotland has the lowest percentage at level 1 or below, while Wales has the lowest at the highest two levels.

Gender differences in reading

Table 9 shows the mean scores of males and females, and the difference in their mean scores.

In all cases, females had higher mean scores and the difference was statistically significant. This was in fact the case in every country in the PISA survey. The differences in each part of the UK were of a similar size. One more encouraging finding, however, is that the gender gap was smaller in the UK than in most other countries.

Summary

The PISA survey produces very rich data which is publicly available and provides a valuable source of data for researchers. The results which have been reported so far, both nationally and internationally, are only the first results and much work is still to be done to investigate the relationships between different parts of the data and to identify the lessons which could perhaps be learnt from comparison with other countries.

What the data so far demonstrates is, firstly, that in science the average performance in all four parts of the UK was similar. The only significant difference was that the mean score of students in Wales was significantly lower than that in England. Males outperformed females in England and Wales but not in Northern Ireland and

Table 6: Mean scores of males and females for mathematics

	Overall mean score	Mean score of males	Mean score of females	Difference
England	*495*	504	487	**17***
Scotland	*494*	497	491	7
Northern Ireland	*506*	514	498	**16***
Wales	*484*	492	476	**16***
OECD Average	*498*	503	492	**11***

Table 7: Mean scores for reading

	Mean	England	N. Ireland	Scotland	Wales
England	499	NS	*NS*		▲
Scotland	496		*NS*	*NS*	▲
Northern Ireland	495	NS		*NS*	▲
Wales	481	▼	▼	▼	

▲ = significantly higher ▼ = significantly lower NS – no significant difference

Table 8: Percentages at reading levels

	below level 1 %	levels 1-5 %	levels 2-5 %	levels 3-5 %	levels 4-5 %	level 5 %
England	*6*	93	81	59	30	9
Scotland	*7*	92	79	57	32	10
Northern Ireland	*4*	95	83	60	29	8
Wales	*6*	92	78	51	24	6
OECD Average	*8*	93	80	57	29	9

Table 9: Mean scores of males and females for reading

	Overall mean score	Mean score of males	Mean score of females	Difference
England	*496*	481	510	**29***
Scotland	*495*	479	512	**33***
Northern Ireland	*499*	486	512	**26***
Wales	*481*	465	496	**31***
OECD Average	*492*	473	511	**38***

* statistically significant difference

Scotland. The widest spread of attainment between the highest and lowest scoring students was in Northern Ireland.

Performance in mathematics showed more variation across the UK countries than performance in science. The mean score of students in England and Scotland was significantly higher than that in Wales, and the mean score in Scotland was also significantly higher than the score in Northern Ireland. Males outperformed females in England, Wales and Scotland with a significant difference in the mean scores. In Northern Ireland the difference in the mean score of males was higher than that of females but the difference was not statistically significant. The widest spread of attainment was again in Northern Ireland.

The average performance in reading in England, Scotland and Northern Ireland was similar. In Wales, the mean score was lower and this difference was statistically significant compared with all three other countries. Females outperformed males in reading in all parts of the UK, as they did in every other country in the PISA survey. As with science and mathematics, the widest spread of performance was in Northern Ireland.

Preliminary analysis of the student questionnaires indicates that students' reported attitudes towards aspects of science and science learning were remarkably similar across the UK. Where there were differences, the most common direction of difference was for students in Scotland to be slightly less positive than those in the other parts of the UK. However, none of these differences was very large.

"The mean score of students [for mathematics] in England and Scotland was significantly higher than that in Wales, and the mean score in Scotland was also significantly higher than the score in Northern Ireland."

Another aspect of the PISA survey which has not yet been investigated within the UK is differences in the educational systems which may have connections with differences in performance. For example, attainment in Wales was lower than the other three UK countries while the spread of attainment in Northern Ireland was widest for all three subjects. There were some indications in the responses to the school questionnaire that fewer resources are available for science education in Wales, which is one possible underlying factor; while it has been suggested that the selective system in Northern Ireland may underlie both the high and the low achievement which was found there. These are hypotheses to be investigated further, and it is perhaps as a source of hypotheses and as an indication of areas of possible concern that the PISA study has the most potential.

While a study which raises more questions than it answers may be frustrating for both politicians and the media, those involved in education know that there are never simple answers to the complexities of improving teaching and learning. The strength of an international study such as PISA is that it can help us learn from other parts of the world, as long as we remember that solutions must still be rooted in the needs of our own educational system and the culture of our society.

References

The OECD international report is at:
www.pisa.oecd.org
The national reports for England, Wales and northern Ireland are at:
http://www.nfer.ac.uk/pisa
Highlights of the results for Scotland are at:
http://www.scotland.gov.uk/Publications/2007/12/03153600/0

Australia

Australian primary schools came into the firing line at the beginning of October, as a national study of headteachers revealed concerns that the primary curriculum had too many subjects and schools were too underfunded to meet standard requirements for English, maths and science. The study underpins Australia's first primary school charter, endorsed by principals who want the educational focus put back on literacy, numeracy and science. It found that national standards were beyond the reach of many schools, particularly those in disadvantaged areas, which were unable to attract a high level of staff and private contributions from parents.

The study recommended that subjects teaching life and social skills, including manners, nutrition, drug education and financial literacy, be dropped from primary school curriculums, and replaced with a subject called Social Education.

New Zealand curriculum

Prime Minister Helen Clark and Education Minister Chris Carter launched New Zealand's new curriculum on 6 November. Ms Clark said that the new curriculum was designed to support school students developing the values and competencies and gaining the knowledge they need for the 21st century. She said that it aims to give all young people the best opportunity possible to achieve their full potential. Mr Carter said that the curriculum contains eight areas of knowledge, covering English, mathematics, languages, technology, science, the arts, social sciences, health and physical education. "The curriculum also includes a range of key competencies young people need to acquire; such as thinking, using language, symbols and texts; managing oneself; relating to others; and participating and contributing," he said.

US maths and reading

Test scores in mathematics and reading have risen significantly, according to results from the National Assessment of Educational Progress (NAEP) 2007, released on 25 September. But the results also show large gaps in achievement between whites and minority groups.

The most recent NAEP maths and reading assessments were taken between January and March 2007 by students in grades four and eight. Although the scores indicate a slight narrowing in the gap between White and Black students in fourth-grade reading and eighth-grade maths since 2005, there were no substantial changes in either grade or subject between White and Hispanic students.

Results from PIRLS 2006

INTERNATIONAL SUPPLEMENT

Liz Twist
Principal Research Officer, NFER

The results of the most recent international survey of primary-aged children were released in November 2007. Three particular aspects of the study appear to have been the focus of most attention in the days immediately following the publication of the international and national reports:

- England's poorer attainment in 2006 in relation to other countries and also in relation to performance in 2001
- children's interest in reading and the amount of time they devoting to playing computer games
- questions about how safe children feel in school.

It is preferable that reporting of the study should look beyond the simple league table of reading scores – PIRLS also collects an array of data by means of questionnaires completed by pupils, their teachers and headteachers, and in some cases by their parents. In addition, in England, it is possible to increase the power of this data set by utilising some of the national pupil-level data available.

However, consideration of this wider picture is not to underestimate the significance of the information about reading standards shown by the latest survey and this is considered in the first part of this article.

Reading attainment in England and Scotland

The latest PIRLS results allow us to look at attainment since 2001 in terms of mean score. In both of the surveys, England and Scotland had a mean score significantly higher than the international average (set at 500 scale points). In 2001, England had a score of 553; this fell to 539 in 2006, a fall that was statistically significant (i.e. it is unlikely to be a chance finding). Scotland achieved a mean score of 528 in 2001, and saw a (statistically non-significant) drop to 527 in 2006.

Whilst presenting the participating countries in a league table tends to attract attention, it provides only a limited view of each country's standing. In fact, the scores of many countries may not be significantly different from one another in the ranking table. Figure 1 shows the participating countries, their mean score and whether or not the score is significantly different from that of England and Scotland. The Canadian province of Ontario is included in this figure.

It is tempting to focus on England's fall from a high position (3rd) in 2001 to a much more lowly 15th in 2006; similarly, with almost the same score in the two surveys, Scotland fell from 14th to 21st. But of course, a different combination of countries are included in the study: Luxembourg, Belgium (Flemish) and Denmark all participated for the first time in 2006 and achieved a score significantly higher than that of England and Scotland. All the countries which dropped out after the first survey had significantly lower scores than England and Scotland.

Nevertheless, it is clear that on the basis of the statistical procedure used to link the two studies, England's score is significantly lower. It is surprising to note that the scores of all three top attaining countries last time (Sweden, the Netherlands and England) have fallen significantly in 2006. NFER have some concerns about the methodology adopted to link the two surveys and will carry out further analyses into this next year.

Several countries recorded significantly higher scores in 2006 and three stand out in particular: the Russian Federation registered an increase of 37 scale points, from 528 to 565; Hong Kong saw an increase of 36 scale points, from 528 to 564; and Singapore increased their scale score from 528 to 558, an increase of 30. In the interval between the two PIRLS surveys, all three countries showing this dramatic improvement have initiated large scale educational reform. The Russian Federation, for example, is in the process of lowering the age at which children start school, from seven to six; the proportion of schools in rural areas, historically lower achieving, has been reduced; and a new national reading curriculum has been introduced.

Those who have followed the results of international surveys in the past will recognise that the high ranking of Hong Kong and Singapore seen on PIRLS in 2006 is characteristic of the Pacific Rim countries in surveys of mathematics and science attainment. Singapore's success is particularly remarkable as the tests are conducted in English, the

Figure 1: Reading achievement in PIRLS

Significantly higher than England and Scotland		
a	Russian Federation	565
	Hong Kong SAR	564
	Singapore	558
	Luxembourg	557
a*	*Canada, Ontario*	*555*
	Italy	551
	Hungary	551
	Sweden	549
	Germany	548
†	Netherlands	547
†a	Belgium (Flemish)	547
a	Denmark	546
Significantly higher than Scotland and not signficantly different from England		
a	Bulgaria	547
	Latvia	541
†a	United States	540
	England	**539**
	Austria	538
	Lithuania	537
	Chinese Taipei	535
Signficantly lower than England and not significantly different from Scotland		
	New Zealand	532
	Slovak Republic	531
†	**Scotland**	**527**
	France	522
	Slovenia	522
Significantly lower than England and Scotland		
	Poland	519
	Spain	513
b	Israel	512
	Iceland	511
	Moldova, Rep. of	500
	Belgium (French)	500
‡	Norway	498
	Romania	489
a	Georgia	471
	Macedonia, Rep. of	442
	Trinidad & Tobago	436
	Iran, Islamic Rep. of	421
	Indonesia	405
	Qatar	353
	Kuwait	330
	Morocco	323
	South Africa	302

† Met guidelines for sample participation rates only after replacement schools were included.
‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included.
a National Defined Population covers less than 95% of National Desired Population.
b National Defined Population covers less than 80% of National Desired Population.
* The Canadian province of Ontario is included in this figure as it is discussed in the accompanying article

language of education, and yet 74 per cent of the PIRLS sample spoke another language as well as English at home, and a further five per cent did not speak English at all at home.

Reading for different purposes
PIRLS identifies two broad purposes for reading: reading for literary experience and reading to acquire and use information. Part of the assessment is devoted to each of these purposes and separate scales are produced to show each country's relative achievement on these. In 2001, England (equal with Sweden) had the highest score of all participating countries on the literary scale and saw a large drop of 20 points, on the international analysis, in 2006. Whilst there was a significant fall on the information scale, it was less at nine points. For Scotland, the score on the literary scale fell in 2006 by two points but there was no change in performance on the information scale between the two surveys.

Countries testing in English
The countries participating in PIRLS, and other international surveys, are very diverse, in terms of size, economic prosperity, political direction, and cultural and educational traditions. It is sometimes useful to focus on a specific subset of countries with some shared characteristics. The rest of this article will therefore look at information from PIRLS 2006 for two overlapping groups of countries: those testing in English and members of the G8 group of major economic powers.

Range of reading attainment
In the national report for England in PIRLS 2001, attention was drawn to the wide range of achievement evident in the performance of pupils in England. Whilst at that time, children at the 95th percentile (i.e. children scoring higher than 95% of pupils in the sample from England) were scoring higher than other pupils in that equivalent position in all other participating countries, it was apparent that children at the other end of the distribution, the 5th percentile (i.e. those who achieved a score that was exceeded by 95% of pupils) were achieving a scale score that was bettered by children in 13 other countries.

NFER's analysis at that time revealed that this was a feature of the performance of all countries testing in English. When the same analysis was conducted with 2006 data for the selected subset of countries, the same pattern emerged. Further information about this finding is available in other publications (Twist et al., 2007; Whetton et al., 2003) but the pattern is shown in Figure 2, based on data collected in PIRLS 2006.

Figure 2 suggests that all of the selected countries fall into one of three groups, regardless of their overall level of achievement:

Germany and France do rather better, comparatively, with their weaker readers than with their stronger readers.

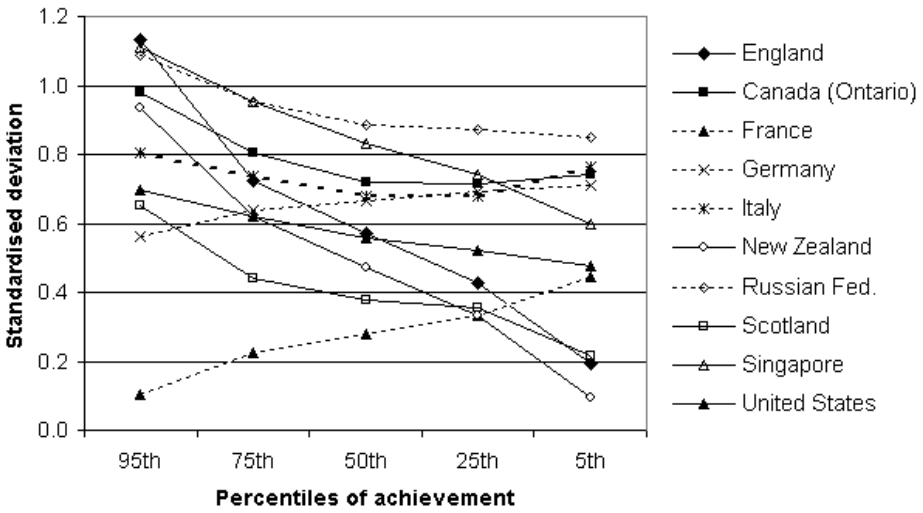
Canada (Ontario), Italy and the Russian Federation do well with their most competent readers and maintain a reasonable position, compared to the performance of other countries, with pupils in the middle and at the lower end of the range of ability in their respective countries.

All other countries, and it is noteworthy that these are all at least English-testing and four out of the five are English-speaking, show high performance for their best readers and then performance, relative to pupils at the same percentile in other countries, tails off. This pattern is least clear with the data from Singapore, where pupils across the ability range do well and is most prominent in the data from England and New Zealand. At the 95th percentile, pupils in England achieve the highest mean score (equal with Bulgaria) of pupils at this level in all forty participating countries (the five Canadian provinces are not included) whereas at the 5th percentile, England ranks 25th.

English-testing	*G8*[3]
England	France
Canada (Ontario) [1, 2]	Germany
New Zealand	Italy
Scotland	Russian Federation
Singapore	
United States[2]	

[1] Ontario is the most populous Canadian province (representing 38% of the country's population) and over 95% of the pupils were tested in English.
[2] The United States and Canada are also members of the G8.
[3] Japan did not participate in PIRLS; England and Scotland participated in PIRLS separately whereas the UK is a member of the G8.

Figure 2: Standardised deviation from the mean of all countries for selected countries



Support provided for the weaker readers
Figure 3 shows information provided by teachers concerning the access to support for pupils with reading difficulties in the selected countries.

Figure 3 is interesting in that it shows that this particular subset of countries appear to fall into one of two distinct groups in the level of support provided for pupils experiencing reading difficulties. In four countries (France, Germany, Italy and Singapore), 50 per cent of pupils or more do not have access to reading specialists; in the remaining five countries (England, New Zealand, the Russian Federation, Scotland and the United States) and the Canadian province of Ontario, this figure was between eight and 24 per cent. Despite considerably greater access to support for the weaker readers in England, Scotland and the United States in particular, the range of achievement remains wide.

The teaching of reading
PIRLS collects information about the different ways reading is taught by means of a questionnaire completed by teachers of the pupils involved in the survey.

Curriculum time devoted to reading
In many countries, including England and Scotland, there is no prescribed

Figure 3: Access to support for pupils with reading difficulties

Country	Percentage of pupils in classrooms with						
	Learning support teacher available			Other specialist/s available			No access to any specialist
Canada (Ont.)	17	41	42	7	63	30	17
England	**24**	**60**	**16**	**2**	**62**	**36**	**8**
France	6	33	61	1	12	87	50
Germany	5	35	59	3	11	86	58
Italy	0	5	95	2	6	92	89
New Zealand	27	40	33	11	60	28	16
Russian Fed.	15	22	63	27	49	24	24
Scotland	**18**	**36**	**46**	**10**	**72**	**18**	**8**
Singapore	7	14	79	5	18	77	69
United States	34	37	29	27	60	13	8

Figure 4: Intended and implemented weekly teaching time for language and reading (formal and integrated)

	Intended			Implemented		
	Total hours of teaching time per week	% of total teaching time		Average hrs of teaching time per week	% of total teaching time	
		Language (%)	Reading (%)		Language (%)	Reading (%)
Canada (Ont.)	*	*	*	25	34	23
England	**24**	*	*	**25**	**28**	**13**
France	26	26	30	24	38	23
Germany	20	32	*	22	32	13
Italy	30	25	25	30	26	16
New Zealand	*	*	*	24	37	23
Russian Fed.	19	42	30	19	39	29
Scotland	**23**	**20**	*	**25**	**27**	**16**
Singapore	25	27	*	25	27	16
United States	*	*	*	30	31	29

* teaching time not specified

Figure 5: Materials used in the teaching of reading

	Percentage of pupils whose teachers used at least weekly						
	Reading schemes	Textbooks	Workbooks or worksheets	Variety of children's books	Children's newspapers or magazines	Materials from other subjects	Computer software
Canada (Ont.)	55	68	77	91	20	83	17
England	**49**	**66**	**65**	**93**	**9**	**75**	**32**
France	74	62	63	72	20	82	3
Germany	20	83	92	42	8	68	15
Italy	47	99	92	54	16	52	5
New Zealand	94	20	65	78	18	61	18
Russian Fed.	56	100	53	68	18	61	1
Scotland	**95**	**81**	**82**	**80**	**5**	**60**	**20**
Singapore	34	97	97	41	43	41	33
United States	69	82	85	78	36	74	32

proportion of time for the teaching of reading. The PIRLS questionnaires completed by the teachers and the headteachers provide some information about the intended and the implemented curriculum time devoted to language and specifically reading activities. This is shown in Figure 4.

Italy and the United States operate a longer school day, at 30 hours per week, than other countries in the comparator group. The Russian Federation's teaching week is shorter than the rest at 19 hours. The extent to which the balance of various subjects in the curriculum is prescribed is very variable and where it is prescribed, in practice in some countries a greater proportion of time is actually spent on language activities. The time spent on reading shown in Figure 4 includes reading activities in addition to formal instruction in reading skills and strategies. In England and Scotland, the proportion of time spent on language and on reading activities appears to be very similar. The proportion of time teachers in England spend on the teaching of reading and reading activities, at 13 per cent of teaching time, is equal to that of Germany and one of the lowest in the study.

Figure 5 shows what materials are used by teachers in their teaching of reading to 10-year-olds in the selected countries.

In line with the situation in most of these selected countries, teachers in England and Scotland utilise a variety of resources in their reading teaching. There seem to be close similarities in the use of reading materials by teachers in England and their colleagues in Ontario, with considerable use made of a variety of children's books. These are books, which in contrast to reading scheme texts, do not have a controlled vocabulary and are not published with the explicit aim of helping children learn to read, although clearly their use supports that aim. The other three English-speaking countries, New Zealand, Scotland and the United States, all show widespread use of these texts.

One area of difference between teachers' reports in England and Scotland is in the use of reading schemes: these are much more widely used in Scotland (almost universally at least weekly) than in England. This difference was also apparent in 2001.

In three countries from this group (England, Singapore and the United States) about a third of pupils are in classes where teachers make use of computer software in their reading teaching at least weekly. Only teachers in Hong Kong (36%) report greater use.

Teachers in Italy and Singapore, and to a slightly lesser extent Germany, Scotland and the United States, seem to base their teaching around textbooks and workbooks rather more than teachers in the other countries included in Figure 5.

Data was also gathered about the use of information texts and these are less prominent in the teaching of reading in the selected countries.

Children's out of school activities

The final part of this article looks at an aspect of the study that attracted some media attention: the amount of reading children undertake outside school, and how much time they devote to certain alternative activities. It is relevant not just to compare how frequently these activities are undertaken by children in the selected countries in 2006 but also if there is any change since 2001.

Pupils in the English-testing countries tend to read for fun rather less frequently than their peers in the other selected countries. The exception to some extent is Ontario which has shown a considerable, and significant, increase since 2001. What is particularly interesting is to compare this data with that concerning the frequency with

Figure 6: Pupils reading for fun outside school in 2006 and change from 2001

	Every day or almost every day		Once or twice a week		Twice a month or less	
	2006 per cent of pupils	Difference in per cent from 2001	2006 per cent of pupils	Difference in per cent from 2001	2006 per cent of pupils	Difference in per cent from 2001
Canada (Ont.)	49	14	25	2	26	-16
England	**33**	**0**	**25**	**-1**	**42**	**1**
France	51	2	24	-2	25	0
Germany	53	5	24	0	24	-5
Italy	38	7	25	1	37	-7
New Zealand	42	-1	24	0	34	1
Russian Fed.	58	0	28	-1	14	2
Scotland	**33**	**2**	**24**	**0**	**44**	**-2**
Singapore	27	-3	26	3	47	0
United States	35	1	22	0	43	-1

Figure 7: Pupils reported time spent watching TV and playing computer games

Pupils' responses to 'Outside of school on a normal school day, how much time do you spend watching television?'	5 hours or more (%)	3-5 hours (%)	1-3 hours (%)	Less than 1 hour (%)	No time (%)
Canada (Ont.)	20	19	36	23	3
England	**17**	**19**	**35**	**26**	**3**
France	12	12	41	31	5
Germany	7	9	33	43	8
Italy	13	12	35	36	3
New Zealand	17	16	33	29	6
Russian Fed.	11	15	40	29	5
Scotland	**14**	**15**	**34**	**33**	**4**
Singapore	15	20	41	20	4
United States	28	17	30	22	4
Pupils' responses to 'Outside of school on a normal school day, how much time do you spend playing video or computer games?'	5 hours or more (%)	3-5 hours (%)	1-3 hours (%)	Less than 1 hour (%)	No time (%)
Canada (Ont.)	21	14	20	34	12
England	**22**	**15**	**20**	**32**	**10**
France	16	12	24	33	15
Germany	8	8	21	43	20
Italy	16	11	18	38	17
New Zealand	19	11	19	33	19
Russian Fed.	8	10	19	30	33
Scotland	**23**	**15**	**20**	**32**	**10**
Singapore	15	14	25	31	15
United States	30	14	18	27	12

which pupils are reading stories and novels outside school. Just 22 per cent of pupils in Italy reported reading stories or novels on a daily basis, although this is a significant increase of seven percentage points since 2001. The equivalent figures for England and Scotland are 33 and 35 per cent respectively. The country or province in this selected group reporting the greatest frequency of daily reading of stories and novels is Ontario and the Russian Federation (both 50%), followed by New Zealand (46%) and Singapore (44%). In all the selected countries there was a clear association between higher reading scores and more frequent reading for fun and more frequent reading of stories and novels.

Technology provides many activities which can absorb children's leisure time. Figure 7 shows the amount of time children in the study reported spending on television viewing and playing computer and video games.

The first part of Figure 7 shows how dominant television viewing is in the leisure time of children of this age in these developed countries. It is only the response from the children in Germany which departs from the trend, where over half the children claim to watch television for less than an hour on a school day. The data from England and from Scotland shows very little change from that recorded in 2001.

The question on computer game-playing was asked in a different form in 2001 but nevertheless it is clear that there has been an increase in the amount of time devoted to this activity by children of this age. What also seems clear is that children of this age devote at least as much and often more time to their computer activities as to television viewing. For both television viewing and computer game-playing, the children in the United States record the greatest amount of time.

Conclusions

PIRLS 2006 has provided some important messages to those involved in primary literacy. Some countries have instituted large-scale structural and curricular reform in the intervening years since PIRLS 2001 and in a number of cases have observed dramatic increases in their scale scores. Scotland has not kept pace with the improvements observed in the performance of these countries and England appears to have fallen back. Furthermore, this brief article has provided information about the range of attainment seen in selected countries, showing that a wide range of attainment from the strongest to the weakest readers is a feature of English-speaking countries. But to focus solely on attainment is to underestimate the information provided by comparative surveys. The concern expressed following publication of the latest result about the amount of reading undertaken by choice of children in England appears justified. The PIRLS findings provide added momentum for the National Year of Reading in 2008.

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The PIRLS 2006 national report for England is available from: www.nfer.ac.uk/pirls

The PIRLS 2006 international report is available from: http://isc.bc.edu/pirls2006/index.html

Academic success is not enough

INTERNATIONAL SUPPLEMENT

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There's nothing new in calls for changes in direction around the curriculum: assessment, equalities, choice, personalisation and social cohesion. But it comes as a surprise to hear a succession of national education leaders telling a conference that the curriculum is too narrowly dominated by academic success, and that physical, emotional and especially creative development are suffering as a consequence. They say that assessment must evaluate each individual student against the effectiveness of the system, and these require different approaches. Differential investment is necessary to equalise access and opportunity, especially for vulnerable children and those of migrant workers. They say that the needs of such children should have greater priority than meeting parental choice. Individual differences, needs and strengths must be more successfully accommodated. Education holds the key to social harmony, encouraging pupils' knowledge of and respect for other cultures, and for the traditional national culture. These are not the sort of views we are accustomed to hearing from our politicians, not all of them anyway.

Not until the Director General of the National Education Development Strategy Institute presents a paper on the issues raised by the uniquely high proportion of single children, many of whom are now entering teaching, does the policy content take on a specifically Chinese context of only limited relevance to Britain.

Shanghai education forum

This summer's Shanghai Education Forum had as its theme 'School Education in Urban Areas in the Perspective of Globalisation'. The forum blends contributions from senior politicians and administrators from Shanghai and China more broadly with a similar number from overseas speakers. Speakers included the Leader of the Chinese Ministry of Education, the President of the CPPCC (Chinese People's Political Consultative Conference) Shanghai Committee, the Director-General of the Shanghai Municipal Education Commission, the President of the China Education Society, the Director of the Basic Education Division of UNESCO, the Head of the OECD's Educational Indicators and Analysis Division, academics from America and Finland, administrators from Australia and the USA – and me. It was my first visit to China, and I hadn't been expecting to hear Chinese leaders expressing so forcefully, and with such consistency, a vision of educational development and reform that in some ways eclipses that of our own politicians. It probably helps that they don't have to worry about how the *Daily Mail* will respond.

Education, of course, has recently developed very much further and faster, and from a much lower base, in China than in Britain (from less than five per cent enrolling in schools 50 years ago to the almost complete adoption of nine years compulsory schooling today). Rapid expansion of higher education accompanies a continuing focus on the development of basic education. Shanghai encompasses the full range of activities. It is by far China's most economically successful city region, and its politicians and administrators are very obviously proud of their achievements and they are pleased to discuss them, by creating events such as the annual Education Forum, where they can exchange views with international visitors.

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So why are they taking a lead in arguing for changes that our own politicians seem reluctant to adopt? Well, it certainly isn't because they're going 'soft on standards'. Their awareness of the importance of education to economic and social development is paramount. Rather, it is because they have recognised that the emphasis on academic success (which, like here, has been narrowly focused and highly competitive) may be necessary, but it is neither sufficient to provide the range of skills required in a rapidly globalising economy, nor to underpin the harmonious society which – like ours – faces threats that require a positive response.

There is also the need to develop so-called 'soft skills' such as creativity, problem solving, independent learning and entrepreneurialism. These have been matters of growing concern for some time both in China and the UK, indeed throughout the economically developing world. The Chinese, and Shanghai in particular, face pressures arising from their phenomenal growth rate that greatly exceed those found here or elsewhere. These include huge disparities in provision between urban centres and the vast rural hinterland; the scale of migration from the latter to the former; inevitable accompanying social tensions, and growing concern over issues such as drug use.

Explicit determination

We clearly have much in common with China. But our own leaders do not, apparently, yet fully share the explicit determination of the Chinese to move away from the dominance of exams. As the Deputy Director-General of the Beijing Municipal Education Commission put it: "Equity must be accompanied by quality … the public sometimes evaluates on the basis of prejudice, so we need objective, scientific methods to set standards, targets and so on, with incentives to secure their achievement. Evaluation must meet the needs of students, society and the nation – not just be focused on one aspect, exams, but comprehensively focus on all-round, harmonious and sustainable development of students, the community, the environment and society. Education in China and the Orient has been very aligned to exams, but the authorities really want to change this. We have spent about six years trying to curb this trend, and have developed indicators covering a much wider range of outcomes. Some school leaders didn't take much notice, but now they realise that all sorts of PIs can be included in the assessment/evaluation. We are now re-aligning the secondary curriculum to reflect these changes, but many parents and others have a strong addiction to academic scores, which will take time to change – but we have to make that effort."