The Primary Review

... children, their world, their education

PRIMARY REVIEW
RESEARCH BRIEFINGS
4/2

# STANDARDS IN ENGLISH PRIMARY EDUCATION: THE INTERNATIONAL EVIDENCE

Chris Whetton, Graham Ruddock and Liz Twist
National Foundation for Educational Research

This briefing draws on Primary Review Research Report 4/2 *Standards in English Primary Education: the international evidence,* by Chris Whetton, Graham Ruddock and Liz Twist. **The full report, which was specially commissioned for the Primary Review, lists all sources consulted and is available at www.primaryreview.org.uk.**

The report covers:

- The nature of international comparative surveys
- Associated methodological issues
- Results for English primary students in mathematics, reading and science
- Changes over time

## The nature of international comparative surveys

There are currently two main sets of international surveys: those conducted by the International Association for the Evaluation of Educational Achievement (IEA, www.iea.nl) and those conducted by the Organisation for Economic Cooperation and Development (OECD, www.pisa.oecd.org) as part of the Programme for International Student Assessment (PISA). The IEA studies have their roots in educational research and their content is defined by reference to the curricula of the countries involved. PISA is steered by the governments of the OECD member states. Its approach has been to define the skills needed by economically advanced countries and then to assess the extent to which these are being acquired in schools, independently of the countries' curriculum requirements. For this reason, PISA tests students at or near the end of their schooling, and does not provide information on their performance at the primary stage.

Until recently, the IEA studies have also not concentrated on primary schooling, so the information for this age group from international comparative studies is relatively sparse. To date, there have only been six reputable international studies of primary-aged children in which England has participated. Information is thus rather sporadic and conclusions about comparative educational standards at the primary stage should be drawn with caution.

## Methodological Issues

If assembling evidence of standards in one country is difficult, doing so across many countries borders on the impossible. The difficulties stem from the extent of difference between the participating countries in respect of educational philosophy, education system structure, curriculum and language.

Current international surveys use a number of techniques to attempt to overcome these difficulties. The underlying constructs to be assessed are published in framework documents. The test developers attempt to draw on material which covers a range of cultural approaches. The translations of tests are checked and verified carefully and sensitively. The samples are drawn or checked by independent sampling organisations and their achievement is monitored. The achieved sample ratios required are high and countries failing to meet them are excluded. Independent monitors view test administrations in each participating country. The analysis techniques include checks for dimensionality and the functioning of items. The survey reports are careful to make explicit the extent and significance of national differences.

Despite these precautions, the surveys remain subject to four kinds of criticism. These concern:

- their underlying conceptualisation as research enterprises;
- cultural and linguistic problems;
- their statistical and psychometric basis;
- sampling methodology.

However, we believe the methodology of the surveys summarised below is sufficiently robust that their results can be considered to give a reasonable impression of the performance of the students in the countries concerned.

**Mathematics**

The first systematic information on how primary mathematics performance in England compared with that in other countries was from the second International Assessment of Educational Progress (IAEP) study in 1991. This had 9 year olds as the target age group.

The level of performance displayed by English students could be described as poor. It did not significantly differ from that of seven other participants and England was outperformed by five countries: Korea, Hungary, Taiwan, the Soviet Union and Scotland.

The TIMSS series of studies which assess mathematics and science began in 1995. These allow trends in performance over time to be identified. There have been two completed TIMSS surveys involving primary age children, in 1995 and 2003.

The 1995 TIMSS survey involved two adjacent cohorts, which in England were Years 4 and 5. Again, England's performance in mathematics was poor compared to most developed countries. Fourteen countries outperformed England including most other English-speaking countries.

England's relative performance level improved significantly from 1995 to 2003. This increase was the largest change in performance in any of the countries participating in both years. The only countries which had higher average scores than England were Singapore, Hong Kong, Japan, Chinese Taipei, Belgium (Flemish) and the Netherlands. The countries which England itself outperformed were: United States, Italy, Australia, New Zealand, Scotland, Norway, and eight other countries.

**Reading**

In contrast to mathematics and science, the cycle of international surveys of literacy attainment has been sporadic. A proper sequence only began with the Progress in International Reading Literacy Study (PIRLS) of 2001. Previously, the ages tested, as well as the number and nature of participating countries, varied with each study.

The 1971 IEA survey tested three age groups including 9-year-olds. England and Wales (jointly) and Scotland participated in this survey. England and Wales, and Scotland, were outperformed only by pupils in Sweden, Italy and Finland. Students in a further eight countries, including those in the Netherlands and the United States, achieved less well.

The 1991 IEA reading survey again involved 9-year-olds, but England withdrew before the main survey took place. An unofficial study which used components from this survey took place in 1995. This suggested that attainment in England and Wales in 1995 would have resulted in a position in about the middle of the international table in 1991.

The next full survey was PIRLS in 2001. Within the 35 participating countries, England's performance in PIRLS 2001 was in the top group of countries which included Sweden, the Netherlands and Bulgaria, and was significantly higher than all other participating countries, including France, Germany, Italy, Scotland, New Zealand and the United States. It was therefore evidence of high standards of reading in English primary schools for children at the age of about nine.

In addition to the high *average* achievement, the other most notable feature of the results from England was the wide *range* in achievement, also a feature of earlier surveys.

## Science

The Second IEA International Science Study, administered in 1984, was the first to involve primary age pupils. The results of this survey did not suggest a high level of performance in science in England at that time. England was outperformed by seven countries (Japan, Korea, Finland, Hungary, Italy, Australia, USA). The only countries which performed less well than England were the Philippines and Nigeria.

The next international science survey involving primary students was the 1991 IAEP study of nine-year-olds. A cautious interpretation of the results is that Korea and Taiwan outperformed England, while England outperformed Slovenia, Ireland and Portugal. England's results were similar to those for the USA, Canada, Hungary, Scotland, Spain, the Soviet Union and Israel.

The picture of England's science performance obtained in the first TIMSS survey of 1995 was rather different from that shown from the earlier surveys. Only three countries did better than England, two from the Pacific Rim (Japan and Korea) and the USA. England performed at a similar level to several of its European neighbours, and outperformed thirteen other countries from around the world. Overall, the level of performance demonstrated by English students was high.

The next full TIMSS survey was in 2003. England's performance level increased significantly from 1995 to 2003. Only Singapore and Chinese Taipei outperformed England, with Japan, Hong Kong and the USA performing at a similar level. England's score was significantly higher than that of all the other participating countries. Again England showed a high level of performance, outscoring all the other European countries which participated.

## Conclusions

- **Direct evidence on the performance of primary school pupils in England from international surveys is sparser than might be expected or hoped, and conclusions about comparative educational standards at the primary stage should be drawn with caution.** Prior to the 1990s, international surveys were irregular and methodologically weak. The number which included primary children was rather small. Recently, international organisations have established regular cycles of surveys which offer the prospect of better examinations of trends over time. One series, the OECD's PISA, has thus far concentrated only on the outcomes of schooling and not directly addressed primary children. The other series, that of the IEA, has addressed the attainment of primary school children in mathematics, science and reading.

- **In mathematics the performance of primary pupils in England is currently in the middle rank**, below that of several Pacific Rim and northern European countries, but significantly better than some other English speaking countries such as the USA, Australia, New Zealand and Scotland. However, this middle ranking does represent a slight improvement from earlier surveys in which England's performance was very poor.

- **For reading, there are greater cultural problems with the assessment, and fewer surveys. Subject to this important caveat, the most recent survey, PIRLS in 2001, indicated that the reading skills of English pupils were among the highest in the world,** with good achievement in both literary and information reading. This does seem to have been an improvement on the standing in earlier surveys, though the reliability of the evidence from those is weak.

- **There is some evidence that English primary pupils' relatively high attainment in reading skills is at the expense of their enjoyment of reading.**

- **Primary science represents something of a success story for England. There is clear evidence of a rise in performance from 1995 to 2003 even though England was already among the highest in the participating countries in the 1990s.** For the period before 1995 the available data is sparse, but it does seem that England's performance in science in earlier surveys was at a lower level.

- **A consistent and disturbing factor in England's results across all three subjects is a wide spread of scores, signifying a much bigger gap between high and low attaining pupils than in many other countries**. In reading and science, high attaining English pupils are among the top ranking in the world, but the greater spread of attainment means that the low attaining pupils are a long way below these. For mathematics, the average performance is also poor by the standards of other English speaking countries and those of many European and international competitors.

- **International surveys now have a more robust though still not perfect methodology and are an important source of information on the relative performance of England's education system**. Since their data is publicly available, they are also a resource for much secondary analysis, as yet relatively unused. There are further studies in progress, PIRLS 2006 and TIMSS 2007, which will continue the time series of comparative data.

---

**FURTHER INFORMATION**

**The report on which this briefing is based: Whetton, C., Ruddock, G. and Twist, L. (2007) *Standards in English Primary Education: the international evidence* (Primary Review Research Survey 4/2), Cambridge: University of Cambridge Faculty of Education. ISBN 978-1-906478-02-5.**

The report is available at www.primaryreview.org.uk and is one of 32 Primary Review interim reports. Two of these deal with the opinion-gathering strands of the Review's evidence base. The remainder report on the thirty surveys of published research which the Review has commissioned from its 70 academic consultants. The reports are being published now both to increase public understanding of primary education and to stimulate debate during the period leading up to the publication of the Review's final report in late 2008.

The Primary Review was launched in October 2006 as a wide-ranging independent enquiry into the condition and future of primary education in England. Supported by Esmée Fairbairn Foundation, it is based at the University of Cambridge Faculty of Education and directed by Professor Robin Alexander.

The Review has ten themes and four strands of evidence (submissions, community and national soundings, surveys of published research, and searches of official data). The report summarised in this briefing relates to the **Research Survey** strand and the theme **Quality and Standards.**

**Enquiries: The Administrator, The Primary Review, Faculty of Education, 184 Hills Road, Cambridge, CB2 8PQ. Phone: 01223 767523.**

**Email: enquiries@primaryreview.org.uk . Website: www.primaryreview.org.uk.**

**Press enquiries: richard@margrave.co.uk (Richard Margrave, Communications Director).**

For the text of the full report, and for other interim reports in this series, go to **www.primaryreview.org.uk/Publications/Interimreports** .

This briefing, and the report which it summarises, have been commissioned as evidence to the Primary Review. The analysis and opinions they contain are the authors' own.

Esmée Fairbairn FOUNDATION

UNIVERSITY OF CAMBRIDGE *Faculty of Education*