

## **COMPARISONS OF EDUCATIONAL ATTAINMENT**

### **BACKGROUND**

1. At the Education Committee's meeting of the 10<sup>th</sup> December 2008, there was a discussion concerning statistical information that had been published from the Trends in International Mathematics and Science Study (TIMSS)<sup>1</sup>. Northern Ireland data was not published. The Committee requested information on TIMSS and the Department subsequently confirmed that Northern Ireland had not participated in the 2007 study. The Department stated that it was reviewing potential involvement in the next study, scheduled for 2011. However, the Department stressed that the cost of participation, in the region of £400,000, would be a key factor in its deliberations. The Department also drew attention to the fact that Northern Ireland did participate in the Programme for International Student Achievement (PISA).<sup>2</sup> At the same meeting, the Committee agreed to commission a short Assembly research paper assessing Northern Ireland's comparative position with respect to educational attainment. Following a short scoping of potential data sources relevant to this research and discussions with the Committee Clerk, the following terms of reference were agreed:

*"To provide a comparative assessment of educational attainment in Northern Ireland with a focus on performance relative to the rest of the United Kingdom, Republic of Ireland and other European countries. Comparisons to include qualifications at school leaving and attainment data generated from the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA)."*

2. Northern Ireland's comparative performance is therefore presented under the following headings:
  - Compulsory and 'post – compulsory' education performance; and
  - Programme for International Student Assessment (PISA) performance.

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<sup>1</sup> Further information on the TIMSS study is available at: [http://www.nfer.ac.uk/research-areas/timss/timss\\_home.cfm](http://www.nfer.ac.uk/research-areas/timss/timss_home.cfm)

<sup>2</sup> Letter from Department to Committee on Trends in International Mathematics and Science (TIMMS), date 12<sup>th</sup> January 2009.

**COMPULSORY AND 'POST-COMPULSORY' EDUCATION PERFORMANCE**

3. With significant differences between jurisdictions with respect to the types of qualifications obtainable, any comparative assessment of educational attainment performance presents challenges. Even within the UK there are methodological differences with respect to how the same qualifications might be treated. It the case that Scotland has its own system of National Qualifications (NQs) to examine students at the end of their compulsory education. This is distinct from the GCSE system used in the rest of the UK. Further inter-country differences also make straightforward comparisons difficult. For example, GCSE results for schools and further education colleges are included for England and Scotland while results are for schools only for Northern Ireland and Wales.
4. Taking these differences into consideration, the UK Office for National Statistics (ONS) has produced an 'equalised' data series to allow for a form of inter-UK comparisons. This data is presented in the ONS 'Regional Trends' biennial publication<sup>3</sup>. Tables 1 and 2 below present inter-UK comparisons on GCSE performance for the school years 2002/03 and 2005/06.

**Table 1 - Examination achievement at the end of compulsory education in the UK 2005/06 (2002/03 in brackets) - % of students achieving GCSE or SCE Standard Grade / National Qualification (NQ)**

	Number of pupils 05/06 (000's)	% achieving 5 or more A*-C	% achieving 1-4 A*-C	% achieving D-G grades only	% achieving no graded results
Northern Ireland	24.8	63.0 (58.8)	22.6 (22.4)	11.3 (14.5)	3.1 (4.3)
UK	773.8	59.0 (53.5)	21.4 (23.1)	16.9 (18.2)	2.7 (5.2)
England	645.9	59.2 (52.9)	20.6 (22.7)	17.9 (19.2)	2.2 (5.2)
Scotland	64.2	58.6 (58.2)	27.6 (27.7)	9.3 (9.7)	4.6 (4.4)
Wales	38.9	53.8 (51.1)	22.8 (23.0)	16.6 (18.4)	6.8 (7.5)

Source: Compiled by the Office for National Statistics. Country data supplied by Department for Children, Schools and Families, Welsh Assembly Government, Scottish Government and DENI

**Table 2 - % point performance change between 2002/03 and 2005/06**

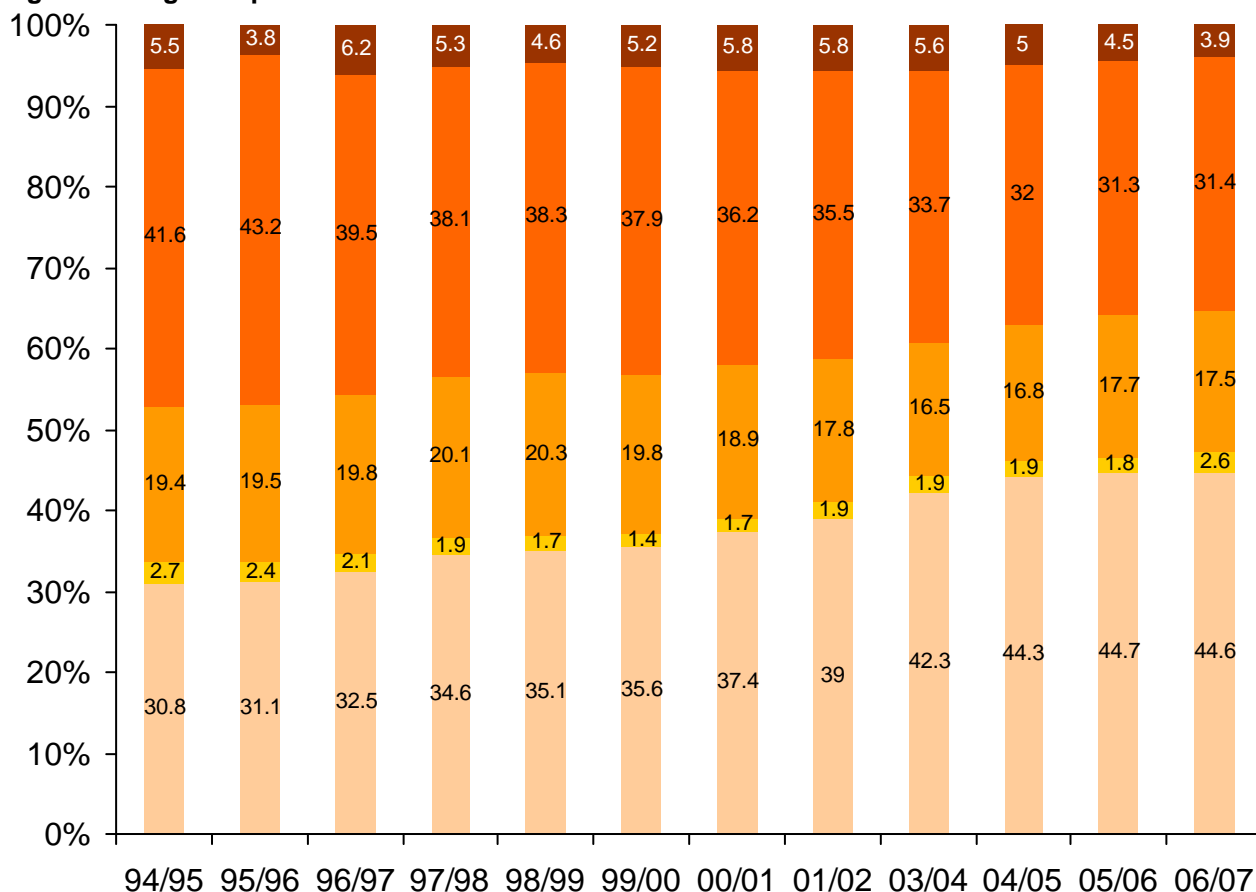
	5 or more A*-C	1-4 A*-C	D-G grades only	No graded results
Northern Ireland	+4.2	-0.2	-3.2	-1.2
UK	+5.5	-1.7	-1.3	-2.5
England	+6.3	-2.1	-1.3	-3.0
Scotland	+0.4	-0.1	-0.4	+0.2
Wales	+2.7	-0.2	-1.8	-0.7

Source: Compiled by the Office for National Statistics. Country data supplied by Department for Children, Schools and Families, Welsh Assembly Government, Scottish Government and DENI

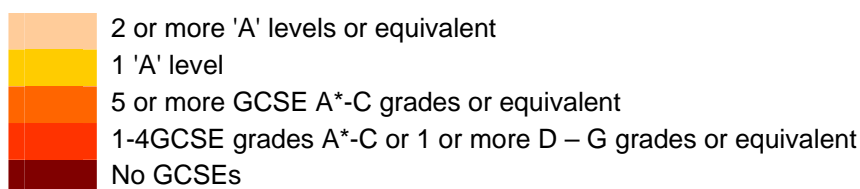
<sup>3</sup> <http://www.statistics.gov.uk/RegionalTrends40/>

5. Northern Ireland's performance was the best in the UK in 2005/06 with respect to those achieving 5 or more A\* - C grade GCSEs. The ONS caution that due to differences in the definitions of grading, inter-country comparisons with respect to those achieving no GCSEs should not be made.
6. While a comparative trend with the rest of the UK is not available, Figure 1 below presents data on the profile of attainment for Northern Ireland school leavers between 1994 / 95 and 2006/07.

**Figure 1 – Highest qualification of Northern Ireland school leavers 1994/95 to 2006/07<sup>4</sup>**



Source: Department of Education Annual School Leavers Survey



<sup>4</sup> School leaver data is unavailable for the 2002/03 school year.

7. There has been a general upward trend in the proportion of pupils achieving 2 or more 'A' levels as their highest qualification having increased by some 12% points over the past ten years (1996/97 to 2006/07). The proportion of pupils achieving lower grade GCSE's as their highest qualification has decreased by 8% points over the same period. The number of pupils achieving no qualifications fell to less than 4% in 2006/07 representing just under 1,000 school leavers.

### **PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT (PISA) PERFORMANCE<sup>5</sup>**

8. The Programme for International Student Assessment (PISA) is a survey the educational achievement of 15-year-olds coordinated by the Organisation for Economic Co-operation and Development (OECD). PISA surveys have taken place in the years 2000, 2003 and 2006. A total of fifty-seven countries participated in the PISA 2006. Twenty-five member-countries of the European Union participated. Results for the UK as a whole are published in the international 2006 PISA report<sup>6</sup>. A separate report has been prepared for Northern Ireland for the 2006 PISA<sup>7</sup>.
9. In Northern Ireland, 107 schools involving 2,278 students participated in PISA 2006. The PISA sampling referee was satisfied that the sample obtained in Northern Ireland was appropriate and that there would be no bias in the results obtained.
10. The survey produces a series of mean (average) scores linked to tasks associated with reading, maths and science. With the scores being based on a survey rather than a census of students, there may be variations in scores that reflect the different sample sizes across countries rather than any 'real' difference in student ability. Rather than a straightforward 'ranking' therefore, it is considered more appropriate to present jurisdictional comparisons in the following format:
- **Northern Ireland performing higher** - Countries where the mean score differences are ***statistically significant*** and are lower than Northern Ireland. These are countries where the scores recorded are likely to be due to real differences in ability and are not accounted for by sampling error.
  - **Northern Ireland performing similar** – Countries where the mean score differences are ***not statistically significant*** compared to Northern Ireland. The scores are not of a magnitude to be able to confidently conclude that Northern Ireland is performing better or worse than other countries. Difference could be due to sampling error.

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<sup>5</sup>OECD PISA home site:

[http://www.pisa.oecd.org/pages/0,2987,en\\_32252351\\_32235731\\_1\\_1\\_1\\_1\\_1,00.html](http://www.pisa.oecd.org/pages/0,2987,en_32252351_32235731_1_1_1_1_1,00.html)

<sup>6</sup>[http://www.pisa.oecd.org/document/2/0,3343,en\\_32252351\\_32236191\\_39718850\\_1\\_1\\_1\\_1,00.html](http://www.pisa.oecd.org/document/2/0,3343,en_32252351_32236191_39718850_1_1_1_1,00.html)

<sup>7</sup> Student achievement in Northern Ireland: Results in science, mathematics and reading among 15-year-olds from the OECD PISA 2006 study.

<http://www.nfer.ac.uk/publications/other-publications/downloadable-reports/student-achievement-in-northern-ireland-pisa.cfm>

- **Northern Ireland performing lower** - Countries where the mean score differences are *statistically significant* and are higher than Northern Ireland. These are countries where the scores recorded are likely to be due to real differences in ability and are not accounted for by sampling error.

11. Table 4 below presents Northern Ireland's performance relative to the other UK nations and the Republic of Ireland. The overall average OECD score is also presented.

**Table 4 Mean Scores UK and Republic of Ireland Comparison**

	Reading	Maths	Science
<b>Northern Ireland</b>	<b>495</b>	<b>494</b>	<b>508</b>
England	496	495	516
Scotland	499	506	515
Wales	481	484	505
Republic of Ireland	517	501	508
OECD average	492	498	500

Source – PISA 2006

**\*Key**

Northern Ireland performing higher  
 Northern Ireland performing similar  
 Northern Ireland performing lower



12. Northern Ireland's performance is broadly in line with rest of the UK and outperforms the OECD average in science and Wales with respect to reading. Northern Ireland is outperformed by Scotland with respect to maths. The Republic of Ireland out-performed Northern Ireland with regard to reading.

13. Further tables detailing Northern Ireland's relative performance against a wider range of OECD countries is presented in Annex 1.

14. In addition to the analysis of mean scores from the PISA 2006, two further aspects of the PISA study relating to educational attainment are presented below:

- Distribution of performance; and
- Gender differentials.

***Distribution of performance***

This measurement is particularly useful in assessing how far the performance across the disciplines tested is consistent within the group or if there is a wide distribution of ability between the best and poorest performing.

15. The measurement of distribution of performance is the difference between the mean score of the lowest performing 5% of students (5<sup>th</sup> percentile) and the mean score of the highest performing 5% (95<sup>th</sup> percentile). Table 5 below presents distribution data across the UK and the Republic of Ireland on the PISA 2006 for reading, mathematics and science skills.

Table 5 – Distribution of attainment for reading, mathematics and science – UK and Republic of Ireland comparisons

<b>Reading</b>			
	<b>Lowest 5%</b>	<b>Highest 5%</b>	<b>Range</b>
<i>Northern Ireland</i>	311	659	348
<b>England</b>	317	654	337
<b>Scotland</b>	334	650	316
<b>Wales</b>	312	635	323
<b>Republic of Ireland</b>	358	661	303
<b>OECD average</b>	317	642	324
<b>Maths</b>			
	<b>Lowest 5%</b>	<b>Highest 5%</b>	<b>Range</b>
<i>Northern Ireland</i>	341	647	306
<b>England</b>	350	643	293
<b>Scotland</b>	367	647	279
<b>Wales</b>	351	621	270
<b>Republic of Ireland</b>	366	634	268
<b>OECD average</b>	346	645	300
<b>Science</b>			
	<b>Lowest 5%</b>	<b>Highest 5%</b>	<b>Range</b>
<i>Northern Ireland</i>	320	686	367
<b>England</b>	336	686	350
<b>Scotland</b>	350	679	330
<b>Wales</b>	339	673	334
<b>Republic of Ireland</b>	351	660	309
<b>OECD average</b>	340	652	311

Source – PISA 2006

\*Key

Highest score within percentile group

Lowest score within percentile group



16. Northern Ireland's performance across the range of abilities shows high scores amongst the top performing students but the lowest scores amongst the poorer performing students on all three measures. Northern Ireland scores for lowest percentile fall below the OECD average on all three measures. Northern Ireland also records the widest range of scores across all three measures and all are in excess of the OECD average. The generally high range and spread of attainment reflects the presence of a considerable gap between the highest and lowest performing students. The authors of the Northern Ireland report point to Northern Ireland having the widest gap out of all of the individual OECD participant countries with respect to science and only seven countries reporting a wider gap with regard to reading.

17. In the absence of the raw data from the study, it is not possible to assess further issues concerning the spread of attainment.

**Gender differentials**

18. Table 6 below shows that differentials between male and female students in Northern Ireland are not so prevalent compared to elsewhere in the UK or the Republic of Ireland. The out-performance of girls over boys with respect to reading attainment occurred in all PISA 2006 participating countries. The gap in Northern Ireland was not so pronounced as many other countries.

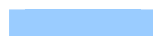
**Table 6 – Gender differentials in attainment for reading, mathematics and science – UK and Republic of Ireland comparisons – boys mean score:girls mean score**

	<b>Reading</b>	<b>Mathematics</b>	<b>Science</b>
<b>Northern Ireland</b>	479:512	497:491	509:507
<b>England</b>	481:510	504:487	521:510
<b>Scotland</b>	486:512	514:498	517:512
<b>Wales</b>	465:496	492:476	510:500
<b>Republic of Ireland</b>	500:534	507:496	508:509
<b>OECD average</b>	473:511	503:492	501:499

Source – PISA 2006

\*Key – statistically significant

Boys out - perform girls



No gender difference

Girls out - perform boys



## ANNEX1 – PISA PERFORMANCE 2006

### Key

Northern Ireland performing higher  
Northern Ireland performing similar  
Northern Ireland performing lower



EU Members underlined

### READING PERFORMANCE

Country	Score	Country	Score
Korea	556	New Zealand	521
<u>Finland</u>	547	<u>Republic of Ireland</u>	517
Hong Kong – China	536	Australia	513
Canada	527		
<u>Liechtenstein</u>	510	<u>Denmark</u>	494
<u>Poland</u>	508	<u>Slovenia</u>	494
<u>Sweden</u>	507	Macao China	492
<u>Netherlands</u>	507	<u>Austria</u>	490
<u>Belgium</u>	501	<u>France</u>	488
<u>Estonia</u>	501	Iceland	484
Switzerland	499	Norway	484
Japan	498	<u>Czech Republic</u>	483
Chinese Taipei	496	<u>Hungary</u>	482
<b>Northern Ireland</b>	<b>495</b>	<u>Latvia</u>	479
<u>Germany</u>	495		
<u>Luxembourg</u>	479	Turkey	447
Croatia	477	Chile	442
<u>Portugal</u>	472	Russian Federation	440
<u>Lithuania</u>	470	Israel	439
<u>Italy</u>	469	Mexico	410
<u>Slovak Republic</u>	466	<u>Bulgaria</u>	402
<u>Spain</u>	461	<u>Romania</u>	396
<u>Greece</u>	460		



**MATHS PERFORMANCE**

Country	Score	Country	Score
Chinese Taipei	549	Japan	523
Finland	548	New Zealand	522
Hong Kong – China	547	<u>Belgium</u>	520
Korea	547	Australia	520
<u>Netherlands</u>	531	<u>Estonia</u>	515
Switzerland	530	<u>Denmark</u>	513
Canada	527	<u>Czech Republic</u>	510
Macao China	525	Iceland	506
Liechtenstein	525	<u>Slovenia</u>	504
<u>Austria</u>	505	<u>Slovak Republic</u>	492
<u>Germany</u>	504	<u>Hungary</u>	491
<u>Sweden</u>	502	<u>Luxembourg</u>	490
<u>Republic of Ireland</u>	501	Norway	490
<u>France</u>	496	<u>Lithuania</u>	486
<u>Poland</u>	495	<u>Latvia</u>	486
<b>Northern Ireland</b>	<b>494</b>		
<u>Spain</u>	480	<u>Greece</u>	459
Azerbaijan	476	Israel	442
Russian Federation	476	Serbia	435
United States	474	Turkey	424
Croatia	467	<u>Romania</u>	415
<u>Portugal</u>	466	<u>Bulgaria</u>	413
<u>Italy</u>	462	Mexico	406

**SCIENCE PERFORMANCE**

Country	Score	Country	Score
<u>Finland</u>	563	Japan	531
Hong Kong –China	542	New Zealand	530
Canada	534	Australia	527
Chinese Taipei	532	<u>Netherlands</u>	525
<u>Estonia</u>	531		
Liechtenstein	522	<u>Belgium</u>	510
Korea	522	<u>Republic of Ireland</u>	508
<u>Slovenia</u>	519	<b><u>Northern Ireland</u></b>	<b>508</b>
<u>Germany</u>	516	<u>Hungary</u>	504
<u>Czech Republic</u>	513	<u>Sweden</u>	503
<u>Switzerland</u>	512	<u>Poland</u>	498
Macao-China	511	<u>Denmark</u>	496
<u>Austria</u>	511	<u>France</u>	495
Croatia	493	<u>Italy</u>	475
Iceland	491	<u>Portugal</u>	474
<u>Latvia</u>	490	<u>Greece</u>	473
United States	489	Israel	454
<u>Slovak Republic</u>	488	Chile	438
<u>Spain</u>	488	Serbia	436
<u>Lithuania</u>	488	<u>Bulgaria</u>	434
Norway	487	Turkey	424
<u>Luxembourg</u>	486	<u>Romania</u>	418
Russian Federation	479	Mexico	410

