by Stephen Machin and Sandra McNally

Large benefits, low cost

Is the government's National Literacy Strategy effective?
Stephen Machin and **Sandra McNally** look at the evidence
from the pilot project.

I n 1999 the Moser report identified one in five adults in the UK as being functionally illiterate. How do we ensure that the next generation of adults does not suffer the same fate?

The National Literacy Strategy, introduced in September 1998, is a major initiative aimed at tackling these problems at primary school. It involves a daily "literacy hour", with a practical structure for time and class management and teaching objectives for each term. But does it work? The government has been criticised for failing to meet its own targets for tests at the end of Key Stage 2 (i.e. the 7 to 11 phase of education). Although economists have had much to say about the effect of increasing resources on pupil attainment, they have generally not considered the effect of changing the content and structure of how a subject is taught.

We present evidence that the literacy hour works. It comes from the National Literacy Project (NLP), which was an immediate forerunner of the National Literacy Strategy. This introduced the literacy hour into a sub-set of schools within a number of Local Education Authorities. We show that the policy not only led to a substantial improvement in attain-

ment, but did so at a low cost. It also had a marked impact on the well-known "gender gap" (favouring girls) as it had a larger differential impact on boys.

The NLP was aimed in particular at improving the low levels of reading and writing skills in many badly performing inner city schools. An OFSTED report at the time was critical of the teaching practices in such schools, which included problems like free reading with little or no intervention by the teacher and too much time hearing individual pupils read. In the same way as the National Literacy Strategy, the NLP changed the content and structure of how literacy was taught. This new approach was based on educational research and on international experience of similar schemes, especially in the US. Since the NLP was introduced in only a sub-set of schools two years prior to the National Literacy Strategy (which affected all schools), we have an opportunity to evaluate the effects of the literacy hour by comparing the educational attainment of children in NLP schools with that in similar schools where the NLP was not introduced.

The National Literacy Project was introduced in some 400 junior schools during the school years 1996/97 and

1997/98. (It was also launched in 112 infant schools, but this part is not relevant here.) About 80% of NLP schools were located in inner cities, where the most disadvantaged in England are concentrated. Most schools entered the project because they had weaknesses in reading. The planned cost of the NLP was £12.5 million over five years.

The descriptive part of our overall findings is summarised in Table 1. The upper part of the Table shows two primary school attainment measures for three consecutive years: a) the mean percentile reading score; and b) the percentage reaching Level 4 or above in Key Stage English. Although average performance levels are lower in NLP schools at each point in time (which is taken account of in the regres-

sion approach) an interesting pattern emerges. In "before and after" terms, there is clear evidence of improvement in the NLP schools, compared with the control group.

For reading, the mean score goes up 2.1 percentile points in the NLP schools and falls by 1.1 in the control group. The same relative pattern of improvement is seen for KS2 English, where the percentage of pupils attaining Level 4 or above rises by more in NLP schools (by 12.2 percentage points compared with 8.8 in the control group).

The lower part of the Table shows statistics on secondary school performance in GCSE English five years later. Currently, this can only be done for the 1997 cohort of NLP

The data

The empirical analysis is based on administrative records of pupil-level attainment and on school-level data. For pupils, the data consists of detailed information on educational attainment from when they were of age 11 and age 16. At age 11, all pupils in England are tested at the end of "Key Stage 2". At age 16, exams at the end of "Key Stage 4" (i.e. GCSE or GNVQ) mark the end of a pupil's compulsory education.

The first available year of national Key Stage 2 data for pupils is 1996, the school year before the National Literacy Project was introduced (we refer to school years according to when pupils took the exam – so "1996" refers to the 1995/96 school year). The NLP was introduced for two cohorts, in 1997 and 1998. Pupils within the first cohort finished their compulsory education in 2002. Hence, to evaluate the impact of the NLP on attainment at secondary school, we matched pupil records from 1996 (i.e. pre-NLP) and 1997 with GCSE/GNVQ attainment data in

2001 and 2002 respectively. (At the time of writing, we do not have data on 2003 GCSE results and, therefore, cannot perform the secondary school analysis for the second cohort of children affected by the NLP.) The pupil-level files have detailed information on attainment, gender and codes for the schools attended, which allows us to match national school-level data from the School Performance Tables and files from the LEA and School Information Service (LEASIS). We concentrate on two outcome measures at the end of primary school: the percentile reading score and the percentage of students attaining Level 4 or above in Key Stage 2 English. The second measure is a key policy indicator and is the standard deemed to be appropriate at age 11.

The NLP was introduced in some 400 schools, of which 80% were in inner cities – several LEAs in London and also in Sandwell, Liverpool, Manchester, Sheffield, Newcastle and Bristol. NLP schools represented in

total about 40% of all primary schools within these LEAs. The remaining NLP schools were run by three county councils (Hampshire, Essex and Norfolk), where they represented only about 7 % of all primary schools.

In order to establish a control group against which to measure the performance of NLP schools, we identified geographically adjacent LEAs not involved in the NLP. (If there was more than one, we chose that with the closest pre-policy perform-ance profile.) Where we could find no close control comparison for an NLP authority, it was dropped from our sample. This affected the county councils and Bristol, where the city is completely surrounded by semi-rural areas. However, our sample comprises 72% of all NLP schools in England.

As a robustness check, we have also estimated regressions for a control group consisting of all other maintained schools in England.

Table 1. Descriptive statistics

	NLP Schools				Control LEA schools			
A. Primary school attainment								
	1996	**1997**	**1998**	**change 1996-98**	**1996**	**1997**	**1998**	**change 1996-98**
Percentile reading score	44.4	45.3	46.5	2.1 (.8)	53.9	53.2	52.8	-1.1 (.5)
% reaching Level 4 or above in KS2 English	37.3	47.6	49.5	12.2 (.9)	50.5	57.8	59.3	8.8 (.6)
No. of pupils	12645	12586	12814		22461	21976	22172	
No. of schools	283	284	283		553	551	547	

B. Secondary school attainment								
	2001	**2002**	**change 2001-02**		**2001**	**2002**	**change 2001-02**	
Percentage with GCSE Grade A*-C in English	38.7	42.1	3.4 (1.1)		47.3	48.4	1.1 (.6)	
No. of pupils	5142	5167			18956	19553		
No. of schools	147	145			549	551		

Notes: Panel A covers cohorts 1 and 2 of NLP, while Panel B only considers cohort 1 (due to lack of GCSE data for 2003). Standard errors in parentheses.

schools, which only had one year of exposure to the literacy hour. Again, the changes are larger in the NLP schools, with the figures going up by 3.4 percentage points as compared with 1.1 percentage points in the control schools.

Our analysis, of course, needs to allow for differences in the characteristics of schools and the data allow us to control for a large number of factors. These include infor-mation on outcomes (e.g. results, absences), inputs (e.g. pupil-teacher ratios), social disadvantage (e.g. percentage of students eligible for free school meals or with special educational needs) and type of school (e.g. single sex, grammar). A full account of the methodology will be found in our forthcoming CEE Discussion Paper.

Taken as a whole, the results of our regression analysis strongly corroborate the view that the literacy hour under the NLP significantly raised pupil performance in the primary schools that were exposed it. Furthermore, for the first cohort of children exposed to the literacy hour, there is a positive and statistically significant effect of the policy on GCSE results in English at age 16.

We were also interested to see whether the literacy hour had a differential impact on boys and girls. Boys have tradi-tionally performed worse than girls in literacy-related activi-

ties. For example, in 1996 (the year before the NLP was introduced) only 49% of boys achieved Level 4 or above in KS2 English, compared with 64% of girls (see Table 2). If it is correct that boys have a greater problem than girls with concentration and focus, it might be expected that the NLP would benefit them more.

We do indeed find such a gender difference in the NLP's impact at primary school. For reading, the literacy hour raised boys' mean percentile scores by somewhere between 2.5 and 3.4 percentile points. The probability of achieving Level 4 or above in KS2 English was up by between 2.7 and 4.2% for boys. Effects for girls were considerably smaller and not always statistically significant. Hence the NLP had a large impact on the oft-cited gender gap in literacy.

It is interesting to put this finding for the 1997 cohort against the national figures for attainment in English given in Table 2. It is evident that the gender gap in primary school reading and English has reduced in recent years. Our findings are entirely consistent with the literacy hour having continued to play an important role since the National Literacy Strategy was introduced.

The question remains as to whether the policy was cost

Table 2.   Primary and secondary school English attainment 1966-2002

A. Primary school attainment

% Pupils achieving Level 4 and above in Key Stage 2 English							
	1996	1997	1998	1999	2000	2001	2002	Change % points
	%	%	%	%	%	%	%	1996-2002
All	57	63	65	71	75	75	75	18
Boys	50	57	57	65	70	70	70	20
Girls	65	70	73	76	79	80	79	14

% Pupils achieving Level 4 and above in Key Stage 2 Reading							
	1996	1997	1998	1999	2000	2001	2002	Change % points
								1997-2002
All	n/a	67	71	78	83	82	80	13
Boys	n/a	63	64	75	80	78	77	14
Girls	n/a	71	79	82	86	85	83	12

B. Secondary school attainment

% Pupils achieving Grade C or above GCSE English							
	1996	1997	1998	1999	2000	2001	2002	Change % points
								1996-2002
All	49	52	51	53	54	59	56	7
Boys	40	43	42	45	46	51	48	8
Girls	58	61	59	61	62	66	64	6

Note: Data from DfES national statistics.

effective. We try to answer this by comparing the per pupil costs of the policy with the economic benefits, as reflected in predicted labour market earnings.

The main costs of the NLP were 14 local centres (each about £25,000 a year) and literacy consultants in each participating Local Education Authority (about £27,000 a year for each consultant). Schools also received some funding for teacher training and resources, which was broadly the same for each school (though some account was taken of the pupil-teacher ratio). However, since the National Literacy Strategy was introduced two years after the NLP, only the first two years of the original £12.5 million five-year programme are relevant. The total cost per annum was thus £2.5 million (or about £2.8 million in 2001 prices). The cost per pupil involved was just over £25 a year.

It might be argued that the literacy hour takes teaching effort and resources away from other subjects and that this indirect cost effect (via substitution) should be taken account of in a cost-benefit calculation. However, literacy was being taught in some form before the policy for the same kind of time. Therefore, the literacy hour represents a change in how reading and writing are taught, rather than an increase in the time devoted to the subject. There are also likely to be positive spillovers between pupil subject areas and associated teacher practice.

First, since the ability to read and write are important generic skills, an improvement in how these skills are taught might lead to improved performance in other subjects. Secondly, the literacy hour is likely to have caused teachers to re-evaluate their teaching methods in other subjects. This is important in English primary schools because, generally, pupils within a particular year group are taught every subject by the same teacher. We do indeed find some evidence linking the literacy hour to higher levels of achievement in Mathematics. Thus, if anything, the effects of the NLP are likely to be underestimated in our approach.

To estimate benefits of the policy we investigated the impact of reading scores on future labour market earnings, using the British Cohort Study. This is a panel survey of all those living in Great Britain born between 5 and 11 April 1970. We regressed the log of labour market earnings (at age 30, in 2000) on age 10 percentile reading scores (from 1980). We then include controls for various factors, like gender, region, family background and highest educational qualification achieved by age 30. Since the educational qualification variable is likely to partly capture the effect of the reading score, the effect of reading on labour market earnings is likely to be an underestimate when this variable is included.

These estimates are inevitably somewhat broad brush. But,

assuming that the pupil goes on to work from age 20 to 65 and using a discount rate of 3%, we estimate under a number of realistic assumptions the present discounted value of the cumulative effect of the literacy hour to be somewhere between £2,000 and £5,500.

Whichever way one looks at it, the benefits of the literacy hour seem to be large and the costs small. These findings are of considerable significance to the wider debate about what works best and most cost effectively for improving pupil performance.

Stephen Machin is Director of Research at the CEP, Director of the DfES Centre for the Economics of Education and Professor of Economics at University College London.
Sandra McNally is a member of the Centre for the Economics of Education at the CEP.

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