Department for Education

NFER Teacher Voice Omnibus

March 2013 Survey:

Mathematics teaching in schools

Research Report

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Introduction

The Department for Education submitted six questions to NFER's Teacher Voice Omnibus Survey in March 2013. The questions covered the following topics:

- teachers' A-level subject qualifications;
- hours of time spent teaching in front of a class, overall and for mathematics specifically;
- teachers' main teaching subject; and
- experience of and interest in teaching mathematics.

This report provides an analysis of the responses to the questions, along with supporting information about the survey. Results are presented by school phase (primary and secondary) and, where relevant, by seniority of respondent (senior leaders, i.e. headteachers, deputy headteachers and assistant headteachers, or classroom teachers).

Analysis of findings

The sample

A sample of 1587 teachers completed the online survey. The sample was weighted to ensure that it was representative and included teachers from a wide range of school governance types and subject areas. The sample size was sufficient to allow for comparisons between the primary and secondary sectors. Detailed information about the sample is given in the Annex of this report.

A levels held by teachers

The first question submitted to the Teacher Voice survey asked respondents which A levels they held, specifying various subjects. The survey asked teachers to include qualifications equivalent to an A2[1] level in their response. Respondents could select more than one response. The results can be viewed in Table 1 below.

Almost half (45%) of respondents reported holding an A level in English, making it the most frequently chosen subject from the list we provided. Other common responses included history (28%), mathematics (26%), geography (22%) and biological sciences (22%). In contrast, business studies and further mathematics A levels were held by only 4% of teachers. Fifty-nine per cent held A levels in subjects other than those listed (teachers were not asked to specify what these other subjects were).

There were both similarities and differences in the subjects held across phases. A level English was proportionally the most commonly held qualification across both phases, though a higher proportion of primary than secondary teachers said they held it (54% compared with 37%). History was the second most frequently chosen A level across both phases, held by a similar proportion of teachers within each phase.

A higher proportion of secondary teachers than primary teachers said they held mathematics A level (32% compared with 19% per cent). The pattern was similar for chemistry and physics – 22 per cent and 19 per cent of secondary teachers said they held these A levels, compared with eight per cent and six per cent of primary teachers. However, the proportions of primary and secondary teachers who said they held biological sciences A level were quite similar (20% and 24% respectively). The proportion of respondents who said they held the remaining A levels were similar across both phases.

[1] A full A-level, rather than an AS level.

Responses by seniority were very similar, except that a slightly higher proportion of senior leaders than classroom teachers said they held an A level in history (34% compared with 27% respectively).

Table 1 Which A levels do you hold? Please include any qualifications that are equivalent to A2 level. Do not include any AS level qualifications or qualifications that are equivalent to AS level.

	All	Primary	Secondary
English	45%	54%	37%
History	28%	30%	27%
Mathematics	26%	19%	32%
Biological Sciences	22%	20%	24%
Geography	22%	22%	21%
General Studies	20%	21%	20%
Chemistry	15%	8%	22%
Physics	12%	6%	19%
Art & Design	9%	10%	8%
Psychology	8%	11%	5%
Social Studies	5%	6%	4%
Business Studies	4%	4%	4%
Further Mathematics	4%	1%	6%
Other	59%	63%	55%
Local base (N)	1538	770	773

Respondents were able to select more than one response so percentages may sum to more than 100.
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total.
Source: NFER Omnibus Survey March 2013.

Hours of classroom teaching per week

Respondents were asked to specify the number of hours they teach in front of a class in a typical week. The results are presented in Table 2 below.

Over half of respondents (56%) said they taught between 16 and 25 hours per week. A third (33%) taught for fewer hours than this, while nine per cent taught for 26-30 hours per week. Fewer than five per cent of teachers taught for more than 30 hours per week.

A higher proportion of secondary than primary teachers said that they taught 16-20 hours per week (40% compared with 16%). This was the most common response for secondary teachers; for primary teachers it was 21-25 hours per week (29% said this). A higher proportion of primary than secondary teachers taught 26-30 hours per week (15% compared with 3%). Other responses varied only slightly by phase.

There were marked differences when looking at the data by seniority and phase of respondent. Sixteen per cent of senior leaders said that they did not teach any hours at all in front of a class, compared with two per cent of classroom teachers. Primary senior leaders were proportionally more likely to have zero teaching hours compared with secondary senior leaders. Seven per cent of secondary senior leaders said that they did not teach in front of a class, compared with just over a fifth (21%) of primary senior leaders.

Table 2 Currently, how many hours do you teach, in front of a class, in a typical week?

	All	Primary	Secondary
0 hours	5%	8%	2%
1-5 hours	5%	7%	3%
6-10 hours	9%	9%	9%
11-15 hours	14%	13%	15%
16-20 hours	28%	16%	40%
21-25 hours	28%	29%	27%
26-30 hours	9%	15%	3%
31-35 hours	2%	2%	1%
36-40 hours	1%	1%	1%
41-45 hours	1%	<1%	1%
46-50 hours	<1%	0%	<1%
Local base (N)	1583	796	791

Due to rounding, percentages may not sum to 100
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total. Hours have been grouped for the purposes of the table.
Source: NFER Omnibus Survey March 2013.

Hours of mathematics teaching per week

The survey asked respondents who indicated in the previous question that they spend at least one hour of teaching in front of the class per week to specify the number of hours they teach mathematics in a typical week. Table 3 below presents the results.

The most common response to the question was teaching no mathematics at all, selected by 45 per cent of teachers. The next most frequently given response was teaching between 1 and 5 hours of mathematics per week, cited by 40 per cent of teachers. A high proportion of primary teachers reported that they teach between 1 and 5 hours (77% compared with only 4% of secondary teachers); while an even greater proportion of secondary teachers said that they do not teach any mathematics (82%, compared with 7% for primary teachers). This reflects the fact that the majority of primary teachers are required to teach an hour per day of mathematics, whereas at secondary level teachers specialise in a particular subject. There were no large differences in the reported number of hours spent teaching mathematics according to seniority. In contrast, there were some differences by seniority in the primary phase, with senior leaders proportionally more likely to say that they taught no mathematics compared with classroom teachers (19% compared with 4% did so).

Table 3 Currently, how many hours do you teach mathematics, in front of a class, in a typical week?

	All	Primary	Secondary
0 hours	45%	7%	82%
1-5 hours	40%	77%	4%
6-10 hours	8%	14%	2%
11-15 hours	1%	1%	2%
16-20 hours	4%	<1%	7%
21-25 hours	2%	1%	4%

26-30 hours	<1%	<1%	0%
31-35 hours	<1%	<1%	<1%
36-40 hours	0%	0%	0%
41-45 hours	<1%	0%	<1%
46-50 hours	<1%	0%	<1%
Local base (N)	1486	722	771

Due to rounding, percentages may not sum to 100
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total. Hours have been grouped for the purposes of the table. Source: NFER Omnibus Survey March 2013.

Main teaching subject

Secondary teachers were asked what they considered to be their main teaching subject. The results are presented in Table 4 below.

The most common responses were science (16%), mathematics (14%) and English (13%). Eleven per cent of teachers said that their main subject was 'other' (teachers were not asked to specify what these 'other' subjects were). The proportions of teachers reporting the remaining subjects as their main subject were all eight per cent or lower. The proportions reporting PSHE and citizenship as their main teaching subjects were very low.

Analysis highlighted some small differences according to seniority. For example, higher proportions of senior leaders than classroom teachers said that science was their main teaching subject (21% and 15% respectively). This was also the case for those teachers saying their main subject was 'other', with 18 per cent of senior leaders compared to nine per cent of classroom teachers saying this was the case. One in ten senior leaders (10%) compared with 15 per cent of classroom teachers selected mathematics as their main subject.

Table 4 Which subject would you consider to be the main subject you teach?

	Secondary Teachers
Science	16%
Mathematics	14%
English	13%

Modern Foreign Languages	8%
Design & Technology	7%
ICT	7%
Geography	6%
History	5%
Physical Education	4%
Religious Education	4%
Music	3%
Art & Design	2%
Personal, Social, Health and Economic Education	1%
Citizenship	<1%
Other	11%
Local base (N)	782

Due to rounding, percentages may not sum to 100
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total.
Source: NFER Omnibus Survey March 2013.

Experience of teaching mathematics

The survey asked respondents who had indicated that they currently teach in front of a class for at least an hour a week, but do not teach any mathematics, whether they had previously taught mathematics since becoming a teacher. Caution should be taken when interpreting this data, due to the low number of responses from primary teachers (54). The results are presented in Table 5 below.

Overall, the large majority (76%) said that they had not taught mathematics since becoming a teacher. However, there were large differences according to phase. The majority (95%, N=51) of the subset of primary teachers who were asked thisquestion, responded that they had taught mathematics since becoming a teacher, compared with 18 per cent of their secondary counterparts. As before, this reflects the fact that the majority of primary teachers are required to teach mathematics.

Of the teachers who we asked about their previous mathematics teaching experience, a higher proportion of senior leaders than classroom teachers said that they had taught mathematics since becoming a teacher (39% compared with 21%).

Table 5 Have you previously taught mathematics since becoming a teacher?

	All	Primary	Secondary
Yes	24%	95%	18%
No	76%	5%	83%
Local base (N)	663	54	629

Due to rounding, percentages may not sum to 100
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total.
Source: NFER Omnibus Survey March 2013.

Factors that would encourage teachers to teach more mathematics

The final question submitted to the Teacher Voice survey asked all respondents what would encourage them to teach mathematics or to teach more mathematics than they currently do. The results are presented in Table 6 below.

The most common response, given by 18 per cent of teachers, was 'Nothing - teaching mathematics is not relevant/possible in my current role', while a further 13 per cent said 'Nothing' but gave no further reason. A further 14 per cent responded 'I already teach mathematics as much as I can', while nine per cent said that they would teach more mathematics if they were asked to. One in ten (10%) stated that allocating a greater proportion of curriculum time to mathematics would encourage them to teach mathematics or more mathematics. Lower proportions of teachers gave other responses, including: training, more cross-curricular opportunities, more or better resources and time.

The analysis next looked at the data by phase. A higher proportion of primary teachers than secondary teachers reported that they 'already teach mathematics

as much as [they] can' (19% compared with 9%). Higher proportions of primary teachers compared with secondary teachers reported that they would teach more mathematics if there was more curriculum time allocated to mathematics (19% compared with 1%) or more cross-curricular opportunities (10% compared with 3% for secondary teachers).

The response given by the largest proportion of secondary teachers was 'Nothing' (23%). Twenty one per cent of secondary teachers said that teaching more mathematics was not relevant or possible in their current role, making this the second most frequently given answer. The third most common response among secondary teachers was 'Training' (14% said this).

The only notable difference in terms of seniority was again related to phase. A higher proportion of primary senior leaders (25%) said 'Nothing – teaching mathematics is not relevant or possible in my current role', compared with classroom teachers (11%). In contrast, there was little difference amongst secondary teachers irrespective of seniority.

Table 6 What would encourage you to teach mathematics or to teach more mathematics than you do currently?

	All	Primary	Secondary
Nothing - teaching mathematics is not relevant/possible in my current role	18%	14%	21%
Nothing - I already teach mathematics as much as I can	14%	19%	9%
Nothing	13%	3%	23%
More curriculum time allocated to mathematics	10%	19%	1%
I would be willing to teach more mathematics if I was asked to/there was a need	9%	7%	11%
Training – general	8%	3%	14%
More cross-curricular opportunities	6%	10%	3%
More/better resources	5%	8%	2%

Training/support - teaching methods	4%	5%	4%
Time - general	4%	6%	2%
Local base (N)	1415	700	719

Due to rounding, percentages may not sum to 100
Due to the primary, secondary and all teacher categories being weighted separately, the number of primary and secondary respondents may not sum to the number of teachers in total. Top 10 responses as given by 'all teachers'.
Source: NFER Omnibus Survey March 2013.

Conclusions and implications

When asked which A levels they held, almost half of all respondents said that they had an A level in English. Almost six out of ten said they had an A level in an 'other' subject. History, mathematics, geography and biological sciences were also common responses. A higher proportion of secondary than primary teachers said they held mathematics, chemistry or physics A levels. In comparison, a higher proportion of primary than secondary teachers held an A level in English.

Over half of all respondents said that they teach between 16 and 25 hours in front of a class each week. The primary teachers responding to this survey said that they teach a greater number of hours in front of a class than secondary teachers. For example, 15 per cent teach 26-50 hours per week, compared with five per cent of secondary teachers.

The main message in the data on the amount of time spent teaching mathematics relates to phase. In interpreting the survey findings, it is important to note that primary teachers generally have to teach an hour of mathematics a day, while in secondary school, teachers specialise in a particular subject(s). Only 14 per cent of the teachers who responded to the survey have mathematics as their main teaching subject. This is likely to explain why the majority of primary teachers said that they teach between 1 and 5 hours of mathematics each week, while the majority of secondary teachers said that they do not teach any.

The most common main teaching subjects reported by secondary teachers were science, mathematics and English. Slightly higher proportions of senior leaders than classroom teachers said that science or 'other' was their main teaching subject.

Ninety-five per cent (N=51) of primary teachers who teach in front of a class, but do not currently teach mathematics, said they had taught mathematics since becoming a teacher, while the equivalent proportion for secondary teachers was 18 per cent. Four out of ten senior leaders had taught mathematics since becoming a teacher though they did not currently do so, compared with around two out of ten (21%) of classroom teachers. The data suggests that there might be some capacity for mathematics teaching here.

Secondary teachers were proportionally much more likely than primary teachers to say that nothing would encourage them to teach more mathematics. Theyeither did not specify a reason for their answer or stated that the subject was irrelevant to them. On the other hand, primary teachers were proportionally more likely to say that they already taught as much mathematics as they could or that more curriculum time for mathematics would encourage them the teach the subject for

a greater amount of time. These findings again reflect the requirement for teaching mathematics at primary phase, as distinct from secondary teachers' subject specialism. Only small proportions of teachers suggested other factors which might encourage them to teach mathematics or teach more mathematics. These included training, more cross-curricular opportunities, more or better resources and time.

Annex

How was the survey conducted?

This report is based on data from the March 2013 survey. A panel of 1587 practising teachers from 1243 schools in the maintained sector in England completed the survey. Teachers completed the survey online between the 1st and 6th March 2013. During the survey period, a team of experienced coders within NFER coded all 'open' questions (those without a pre-identified set of responses).

What was the composition of the panel?

The panel included teachers from the full range of roles in primary and secondary schools, from headteachers to newly qualified class teachers. Fifty per cent (795) of the respondents were teaching in primary schools and 50 per cent (792) were teaching in secondary schools.

How representative of schools nationally were the schools corresponding to the teachers panel?

There was an under-representation of schools in the highest quintile in terms of eligibility for free school meals in the sample of primary schools. There was an under-representation of schools in the highest quintile and second lowest quintile in terms of eligibility for free school meals in the sample of secondary schools. In the overall sample (primary and secondary schools) there was under-representation in the highest quintile in terms of eligibility for free school meals. To address this, weights were calculated using free school meals factors to create a more balanced sample. Due to the differences between the populations of primary schools and secondary schools, different weights were created for primary schools, secondary schools and then for the whole sample overall. The weightings have been applied to all of the analyses referred to in this commentary and contained within the tables supplied in electronic format (via Pulsar Web)[2].

Tables S.1, S.2 and S.3 show the representation of the weighted achieved sample against the population. Table S.4 shows the representation of the weighted teacher sample by role in school.

[2] The sample was not weighted for missing free school meal data

Table S.1 Representation of primary schools (weighted) compared to primary schools nationally

		National Population %	NFER Sample %
(Overall performance by KS2 2011 data)	Lowest band	18	14
	2nd lowest band	18	17
	Middle band	17	20
	2nd highest band	21	23
	Highest band	25	26
	Missing	1	<1
% eligible FSM (5 pt scale) (2010/11)	Lowest 20%	20	20
	2nd lowest 20%	20	20
	Middle 20%	20	20
	2nd highest 20%	20	20
	Highest 20%	20	20
	Missing	1	<1
Primary school type	Infants	8	9
	First School	5	3
	Infant & Junior (Primary)	74	72
	First & Middle	0	0
	Junior	7	12
	Middle deemed Primary	0	1
	Academy	5	4
Region	North	31	24
	Midlands	32	30
	South	37	46
Local Authority type	London Borough	11	13
	Metropolitan Authorities	21	21
	English Unitary Authorities	18	20
	Counties	51	46
Number of schools		16753	718

Due to rounding, percentages may not sum to 100.
Some information is not available for all schools and some schools included more than one respondent.

Source: NFER Omnibus Survey March 2013.

Table S.2 Representation of secondary schools (weighted) compared to secondary schools nationally

		National Population %	*NFER Sample %*
Achievement Band (Overall performance by GCSE 2011 data)	*Lowest band*	*17*	*18*
	2nd lowest band	*19*	*16*
	Middle band	*19*	*23*
	2nd highest band	*19*	*21*
	Highest band	*20*	*20*
	Missing	*6*	*3*
% eligible FSM (5 pt scale) (2010/11)	*Lowest 20%*	*19*	*19*
	2nd lowest 20%	*20*	*20*
	Middle 20%	*19*	*19*
	2nd highest 20%	*19*	*19*
	Highest 20%	*19*	*20*
	Missing	*4*	*2*
Secondary school type	*Middle*	*6*	*3*
	Secondary Modern	*2*	*1*
	Comprehensive to 16	*21*	*23*
	Comprehensive to 18	*24*	*29*
	Grammar	*5*	*6*
	Other secondary school	*<1*	*0*
	Academies	*42*	*39*
Region	*North*	*29*	*24*
	Midlands	*33*	*33*
	South	*38*	*43*
Local Authority type	*London Borough*	*13*	*14*
	Metropolitan Authorities	*21*	*22*
	English Unitary Authorities	*19*	*19*
	Counties	*47*	*46*
Number of schools		*3228*	*525*

Due to rounding, percentages may not sum to 100.
Some information is not available for all schools and some schools included more than one respondent.
Source: NFER Omnibus Survey March 2013.

Table S.3 Representation of all schools (weighted) compared to all schools nationally

		National Population %	NFER Sample %
Achievement Band (By KS2 2011 and GCSE 2011 data)	Lowest band	18	16
	2nd lowest band	18	17
	Middle band	17	21
	2nd highest band	21	22
	Highest band	24	23
	Missing	2	1
% eligible FSM (5 pt scale) (2010/11)	Lowest 20%	20	20
	2nd lowest 20%	20	20
	Middle 20%	19	20
	2nd highest 20%	20	20
	Highest 20%	20	20
	Missing	1	1
Region	North	30	24
	Midlands	32	31
	South	37	45
Local Authority type	London Borough	11	14
	Metropolitan Authorities	21	22
	English Unitary Authorities	18	19
	Counties	51	45
Number of schools		19942	1243

Due to rounding, percentages may not sum to 100
Some information is not available for all schools and some schools included more than one respondent
Source: NFER Omnibus Survey March 2013.

Table S.4 Comparison of the achieved (weighted) sample with the national population by grade of teacher (not including Academies)

Role	Primary schools				Secondary schools			
	National Population		NFER Sample		National Population		NFER Sample	
	N[1]	%	N	%	N[1]	%	N	%
Headteachers	15.4	8	66	9	2.1	2	7	1
Deputy Headteachers	10.8	6	80	11	3.3	2	20	4
Assistant Headteachers	6.4	3	52	7	7.6	6	50	10
Class teachers and others	155.6	83	561	74	119.2	90	420	85

National population figures are expressed in thousands and for headteachers, deputy heads and assistant heads are based on full-time positions. NFER sample figures include all staff with these roles and so may include part-time staff.
The NFER sample for classroom teachers and others is based on headcount whereas the national population data is based on FTE teachers
Due to rounding, percentages may not sum to 100
Sources: NFER Omnibus Survey March 2013, DfE: School Workforce in England, November 2011, http://www.education.gov.uk/rsgateway/DB/SFR/s001062/sfr06-2012v7.pdf [21 March 2013].

Table S.5 Comparison of the achieved (weighted) Academies sample with the national population by grade of teacher

Role	All Academies (primary and secondary)			
	National Population[1]		NFER Sample	
	N[1]	%	N	%
Headteachers	1.4	2	6	2
Deputy Headteachers	2.1	3	15	5
Assistant Headteachers	4.0	5	31	10
Class teachers and others	67.7	90	269	84

National population figures are expressed in thousands and for headteachers, deputy heads and assistant heads are based on full-time positions. NFER sample figures include all staff with these roles and so may include part-time staff.
Due to rounding, percentages may not sum to 100

Sources: NFER Omnibus Survey March 2013, DfE: School Workforce in England, November 2011, http://www.education.gov.uk/rsgateway/DB/SFR/s001062/sfr06-2012v7.pdf [21 March 2013].

How accurately do the results represent the national position?

Assuming that our data is representative of the population at large (and we have no evidence to suggest otherwise) we can calculate the precision of results from each of our samples based on the number of respondents. The smallest number of respondents is for the secondary school sample where we have 792 respondents. In this case we can calculate that all results based on the full sample will be precise to within at worst plus or minus 3.48 percentage points. This means that we are 95 per cent sure that if we were to collect results from all secondary schools in the country the results we would get would be within 3.48 percentage points of the results presented in this report. We have marginally more respondents within the primary school sample and hence can be even more confident about our results. For this reason, **within any of our samples, the precision of results based on all respondents will be precise to within at worst plus or minus 3.48 percentage points.**

Certain questions within the survey were filtered and in these cases the number of respondents to questions may be much smaller. In these cases we may need to be more cautious about the precision of the percentages presented within the report. The table below gives a rough guide to the level of precision that can be attributed to each table based upon the total number of respondents. For example, if a table is based upon just 40 respondents we can only be sure that the percentages within that table are correct to within plus or minus 16 percentage points.

Table S.6 Precision of estimates in percentage point terms

Number of respondents	Precision of estimates in percentage point terms
30	18
40	16
50	14
75	12
100	10
150	9
200	7
300	6
400	5
600	4
700	4

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