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Teachers' qualifications and their learners' progress and change in self-confidence

Results from the Teacher and Learner Studies

Research report

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1. The background to the study

1.1 The focus of the study

This report addresses the important question of how teachers' qualifications affect their learners' progress in the adult Skills for Life sector. The combined data sets of teachers' characteristics and learners' test scores and attitudes allowed us to shed light on some under-studied areas of further education in the UK.

The three main questions we addressed were:

1. Are teachers' qualifications related to improvement of learners between pre- and post-course assessments?
2. Do such relationships differ according to the type of qualifications held?
3. Are teachers' qualifications related to changes in learners' self-confidence and other attitudes?

1.2 The policy background

This study is set within the context of the Government's Skills for Life Strategy to improve adult literacy and numeracy in England (DfEE 2001). The problems of low numeracy and literacy levels for a large proportion of the UK adult population have been documented at key points in the last two decades (e.g. the 1999 Moser Report (DfEE 1999), the 2003 *Skills for Life Survey* (DfES 2003a) and the 2006 *Leitch Review of Skills* (Leitch 2006)). In 2003, it was documented that approximately 47 per cent of working-age individuals had severe numeracy difficulties and 16 per cent had literacy difficulties (at Entry levels).

Having poor literacy and/or numeracy is harmful both to low-skilled individuals (who face higher probability of unemployment, unstable jobs and fewer prospects for career advancement) and to the economy at large (which increasingly needs a more highly qualified workforce). Poor skills also have intergenerational effects as parents with low skills have children who perform lower in early tests scores (de Coulon et al. 2008). The Government's response to this problem was the introduction of the Skills for Life Strategy launched in March 2001. The policy's main aim is to provide numeracy and literacy skills to those who have not acquired them during their compulsory schooling. The initial target of improving the literacy, language and numeracy skills of 750,000 adult learners was achieved in 2004 and the second target of improving the skills of 1.5 million adults was achieved in 2007. The subsequent aim of improving the skills of 2.25 million individuals by 2010 was achieved ahead of time in 2008. One important element of the strategy, which indirectly contributes to the attainment of targets, is the improvement in the quality of the teaching of numeracy, literacy and English for Speakers of Other Languages (ESOL).

After 2002, the Government developed mandatory teaching qualifications for new teachers, using a framework that recognised that adult literacy and numeracy

were specialist subjects. As part of Skills for Life, new national core literacy, numeracy and ESOL curricula for adults, based on national standards, were introduced to transform the quality of teaching by setting out the specific skills that need to be taught and learned at each level within the National Qualifications Framework (NQF). The core curriculum for each subject area was designed to ensure consistency and continuity for the learner and to help teachers use focused teaching methods to meet the needs of individual learners. This new approach has been supported by induction and training courses for teachers and new teaching standards. In addition a range of Continuing Professional Development (CPD) programmes and initiatives have been offered at regional, national and local levels.

In accordance with the Government standards (delivered first through the Further Education National Training Organisation (FENTO), and now Lifelong Learning UK (LLUK)) new Skills for Life teachers are expected to have a generic teaching qualification, such as a Postgraduate Certificate in Education (PGCE) or Certificate in Education (CertEd), *and* a new subject-specialist teaching qualification in a subject they are teaching. These changes took place in 2001 for literacy and numeracy teachers and in September 2003 for ESOL teachers. Existing teachers are also being encouraged to take these qualifications and it is proposed that by 2010 almost all existing teachers in the post-16 sector should be qualified.

Updated information on the number of teachers and their profile is provided by a recent NRDC report commissioned by LLUK (Carpentieri et al. 2009). This report estimated that 18,000 individuals are teaching Skills for Life subjects, amounting to around 9500 full-time equivalents. Approximately 37 per cent of these teachers are involved in the provision of literacy, 28 per cent in numeracy and 35 per cent ESOL (using full-time equivalents).

A shortage of experienced and qualified teachers and also teacher trainers was documented early on in the implementation of Skills for Life. This shortage is particularly acute for numeracy. A report by the Inspectorate in 2003 found that there is less demand for numeracy despite equivalent levels of need (ALI/Ofsted 2003). This report also found there is a need for greater expertise in teaching numeracy and that numeracy is too often taught by rote rather than by promulgating the understanding numerical concepts. The Smith Report acknowledged that the adult numeracy strategy is challenging and demanding for teachers and learners alike (Smith 2004).

Data on the teaching qualifications of Skills for Life teachers in the aforementioned NRDC report commissioned by LLUK (Cara et al., forthcoming) suggests that only around a quarter of the Skills for Life teaching workforce (21 per cent of literacy teachers, 29 per cent of numeracy and 28 per cent of ESOL teachers) is fully qualified according to the Government standards of 2006 (i.e. have both a generic and a subject-specialist qualification). Six per cent of literacy, 3 per cent of ESOL and almost one-fifth (18 per cent) of numeracy teachers do not have any teaching qualifications. Skills for Life teachers who teach more than one Skills for Life at a time have even smaller proportions of those fully qualified to teach all of their current subjects.

There is no reliable information on the actual levels of teachers' own skills in maths/numeracy and English/literacy. Yet, as of September 2007, those wishing

to undertake a subject-specific qualification in literacy, numeracy or ESOL have been required to evidence personal skills in English or mathematics at Level 3 (Qualifications and Credit Framework) to join the programme (LLUK 2007).
In this report the focus is on both the teaching qualifications of the Skills for Life teachers and on their personal skill levels in maths and English, and on how these qualifications are related to the progress and change in the attitudes of their learners.

1.3 Evidence from previous studies

As Croninger et al. (2007) mention in their paper, the qualities and qualifications that need to be promoted in teachers in order to achieve better educational outcomes is a fundamental question. Many practitioners, policymakers and researchers argue that teacher quality is vital to student achievement and progress.

Some researchers have suggested that teacher quality is a powerful predictor of student achievement and progress. Hanushek (1992) showed that the difference between having a good teacher and a bad one could exceed one grade-level equivalent in annual educational progress. Rivkin et al. (1998) concluded that teacher quality is the most important predictor of student achievement. Darling-Hammond (2000) argued that the effects of teacher quality on educational outcomes could be more important than student background characteristics, such as economic deprivation or ethnic minority status. Moreover, in the same studies she suggested that well-prepared teachers are more strongly associated with student outcomes than reduced class sizes or even teacher salaries. Sanders and Rivers (1996) came to very similar conclusions about teacher quality. They also suggested that the effect of teacher quality on lower achieving students is even stronger.

Evidence from published research undoubtedly suggests that teacher quality is vital to student achievement and progress. However, there have been many challenges to this type of research. One of the reasons for this is the difficulty in defining what teacher quality is, what characteristics have to be measured in order to look at it and what has to be promoted in teachers to improve it.

Some studies looked at teachers' qualifications, degree level and certification status as a proxy for teaching quality. Yet, these studies have some inconclusive findings or no significant effect when looking at general teaching qualifications or certification status (Croninger et al. 2007). However, other research that looked specifically at the subject area of teachers' qualifications has found that students' achievement gains in high school for mathematics and science are associated with teachers holding a mathematics or science undergraduate or Master's degree (Goldhaber and Brewer 1997, 1998, 2000; Rowan et al. 1997). In addition, when Croninger et al. (2007) looked at specific teaching degrees in elementary education, they discovered that this positively correlates with pupils' achievement in reading in elementary school. They also discovered, interestingly, that over-qualified teachers sometimes appear to do a poorer job. Thus, teachers holding a Master's degree can have a negative effect on elementary school student achievement (Rowan et al. 2002, Croninger et al. 2007).

While existing research provides some guidance regarding the potential importance of teachers' qualifications, there is still a lack of evidence in the UK, particularly for the FE sector. So far most of the literature comes from the compulsory sector, with the vast majority of published studies hailing from the US.

NRDC researchers have started addressing some aspects of the effect of teacher quality on learner performance in studies of effective practice in numeracy, ESOL, reading and writing (Coben et al. 2007, Baynham et al. 2007, Brooks et al. 2007, Grief et al. 2007). The data did not show significant correlation between teachers' qualifications and/or experience and learners' outcomes. However, the question was not the main focus in these studies and very crude correlational methods were used.

Other UK-based research does suggest some significant association between teacher qualifications and learner achievement, both in the further and compulsory education sectors. For example, Brooks et al. (2001) found that one of the factors associated with better progress in reading for adult learners was that all tutors in an FE provider area had a qualified teacher status. In another study, Askew et al. (1997) argued that highly effective numeracy teachers in primary schools in England were much more likely than other teachers to have undertaken mathematics-specific continuing professional development over an extended period.

This report intends to build on existing research carried out on both sides of the Atlantic, by investigating further the relationship between teachers' qualifications and the progress of adult learners in Skills for Life.

1.4 Method

We make use of two very comprehensive data sets gathered by the NRDC with the help of funding from the Department for Education and Skills (DfES). Tests and questionnaires were collected from learners at the beginning and then again at the end of some Skills for Life courses in 2003/4. This data set allowed for a thorough investigation of any changes in the performance and attitudes of learners. This information was combined with detailed questionnaires collected from the teachers of these learners as part of the Teacher Study (Cara et al. 2008).

In particular, it was possible to look at the effect of teaching and subject-specialist qualifications together with the highest qualifications obtained in any subjects.

The full Teacher Study sample consisted of approximately 1000 teachers, interviewed twice: first in 2004/5 and then again in 2006. A very large array of questions were asked with regards to the teachers' socio-economic characteristics (age, gender, ethnicity, etc.), and with regards to their qualifications (whether currently in the process of being obtained or already obtained). Some questions were also asked about their motivations to teach and their attitude on various aspects of Skills for Life (see Cara and Litster (2007) for a detailed investigation of those questions).

Together with this data set, 270 teachers were randomly selected and asked to provide names of learners chosen at random. These learners were then tested twice, first early on in their Skills for Life courses and then at a later stage towards the end of their courses. More details and raw results on the learners' assessments are provided in Warner and Vorhaus (2008).

This report investigates the important question of whether teachers' qualifications and experience affect their learners' progress. Given the diversity of subjects tested, we provide a detailed separate analysis according to the subject taught: literacy, numeracy and ESOL. We implemented a random effect analysis (a standard estimation method in the literature) where the results of later tests scores were regressed on a baseline (early test performance) and a series of variables that captured various influences on learners' progress. In particular, we differentiated between variables describing learners' and teachers' characteristics. We also introduced some variables for the institutions in which the courses were taking place.

Our research used matched student and teacher data, where students' skills were measured before and after their courses. This credible identification and use of panel data helped us to focus on the differences between students taught by different teachers and separate out variation in students' achievement and progress due to their cognitive abilities and other constant characteristics.

2. Descriptive statistics on teacher and learner characteristics

2.1 Learners' profiles

We looked at three different samples of learners in this study. The first group of learners attended numeracy classes and were tested for their numerical skills before and after their course. For the analysis, we selected 227 numeracy learners who had test scores before and after the course and who also had no missing data for other (their own or their teachers' characteristics) variables in the estimation.

The second and third groups of learners had their reading and writing skills tested before and after the course[1]. The second set of 279 learners specified English as their first language; we classified them as literacy learners. The third group of 247 learners identified a language other than English as their mother tongue and we classified them as ESOL learners.

As it can be seen from Table 1, the three groups of learners had some differences among them that had to be taken into account for interpreting any findings from this study. Overall, the literacy and numeracy learners were quite similar. The numeracy learners were slightly younger than the literacy learners and they had higher proportion of learners without any qualifications (which could be explained by their age).

The ESOL learners were quite different from the literacy and numeracy learners. They were older and had better qualifications as well as a much lower proportion of people with learning difficulties among them. To understand the last dissimilarity, cultural differences have to be taken into account, since 12 per cent of the ESOL sample said they did not understand the term 'dyslexia' compared to 2.5 per cent of the literacy learners.

[1] One part of the group was tested for reading skills and the other for writing skills. No learner was given both tests.

Table 1: Learners' characteristics

	Numeracy	Writing and reading	
		Literacy	ESOL
N	227	279	247
Age			
16–19	41.4	37.6	7.3
20–49	46.3	49.9	86.2
50+	12.3	12.5	6.5
Female	56.4	56.6	62.8
First language English	89.4	-	-
White British	83.7	90.3	-
Have dyslexia	15.4	23.3 (2.5% term 'dyslexia' not understood)	1.6 (12% – term 'dyslexia' not understood)
Health-related problems	23.8	-	-
Highest qualifications			
Above Level 2	6.6	6.8	42.3
Level 2	28.2	26.2	15.4
Below Level 2	30.8	35.1	11.3
None	34.4	29.4	24.3
Other	-	1.8	6.5

2.2. Learners' test scores

Table 2 shows summary statistics for the tests in numeracy, literacy and ESOL. For literacy and ESOL, different assessments were performed for reading and writing. We observed that the means of the tests always increased between the pre- and post-tests. In the row entitled mean progress, individual mean progress is shown. The line underneath indicates whether individuals' progress was significantly different from zero. Indeed for four out of the five tests, this appeared to be the case. For the writing test in literacy, no significant progress can be observed in the data. This table does, however, only provide descriptions on the means of the distributions. It could be that some part of the distribution progressed while another part regressed, therefore cancelling each other out in the calculation of the mean.

Table 2: Learners' test scores

	Numeracy	Reading		Writing	
		Literacy	ESOL	Literacy	ESOL
N	237	186	134	93	114
Minimum score	0	0	0	0	0
Maximum score	60	100	100	29	29
Mean score pre-course	22.9 (11.1)	51.4 (23.2)	32.4 (14.9)	16.8 (8.3)	13.0 (7.4)
Mean score post-course	26.1 (12.3)	55.3 (20.6)	38.5 (18.0)	17.6 (7.2)	14.2 (6.8)
Mean progress	3.2	3.9	6.2	0.7	1.2
	$t(226) = 6.04$, $p < .001$	$t(185) = 4.01$, $p < .001$	$t(132) = 4.96$, $p < .001$	$t(92) = 1.44$, $p = .154$	$t(113) = 2.64$, $p = .01$

Note: standard deviations are given in parenthesis.

To check how the entire distributions have moved, we therefore needed to provide more descriptive investigations by displaying the whole distribution of the pre- and post-tests. This is done in Figures 1 to 5.

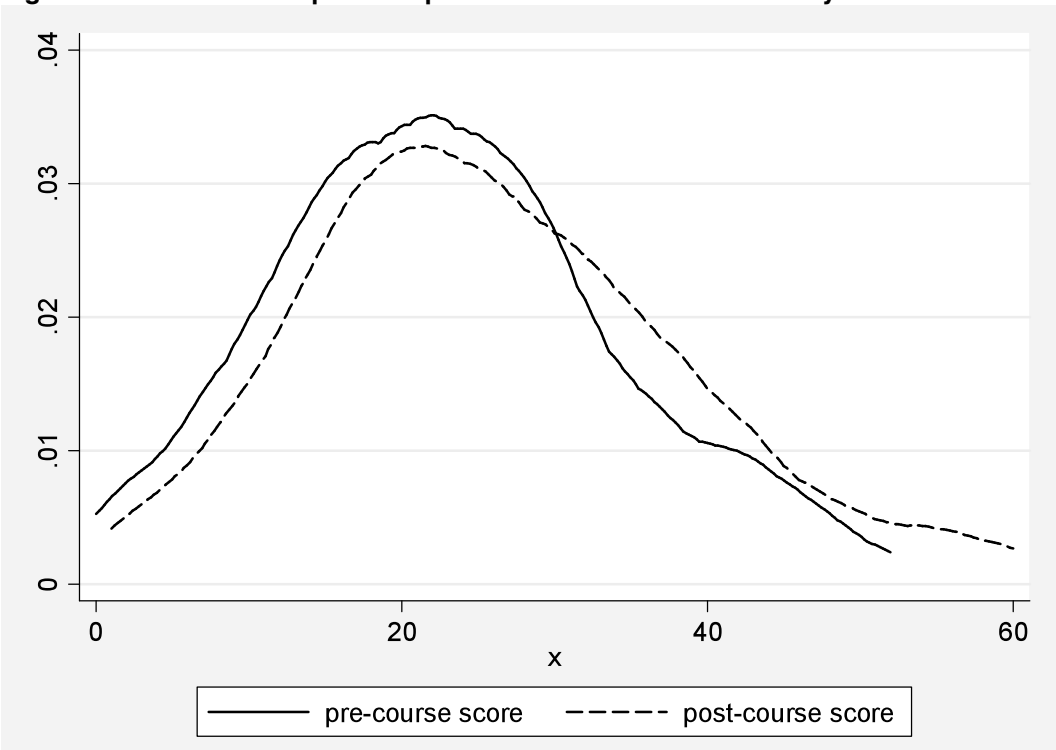
We produced the distribution of test scores at the beginning and the end of the courses (pre- and post-). In Figures 1 to 5 the continuous line is always for pre-course tests and the dotted one is always for post-course tests. These graphs are similar to histograms (i.e. the area below a particular score is the percentage of learners who achieved up to this point). The only difference is that these histograms have been smoothed so that they are easier to compare with each other. As can be observed in Figure 1, the dotted line for post-test scores lies to the right of the continuous line for pre-test scores. This means that for low scores (displayed on the x horizontal lines on the left), learners were more numerous before the courses than after. The opposite is observed for high scores. This implies that the courses did have an effect by moving learners from the bottom of the distribution to higher up ('pushing the curve'). This means that the whole distribution moved to the right after the courses were completed.

Generally, the move to the right is quite clear for numeracy (Figure 1), indicating a clear positive shift of the distribution to the right.

For the reading tests amongst literacy learners, we observe a shift to the right of the distribution as well, but Figure 2 also reveals interesting patterns. The raw difference between pre- and post-tests of 3.9 comes mainly from more learners achieving scores of 60 and more in the post-tests. This difference also arises from a lower proportion of learners who scored around 25 and below but to a lesser extent. Does this suggest that it is mainly very poor performers who improved significantly in the post-tests? Figures 1 to 5 do not give an answer to this question as it does not show individual moves. These individual moves are investigated in the next section.

Lastly we note that both Figures 3 and 5, which are for ESOL learners, show clear shifts to the right of the post-test distribution.

Figure 1: Distribution of pre- and post-course scores in numeracy



For the writing tests amongst literacy learners, we knew from Table 2 that no significant mean progresses were observed. We can see now based on Figure 4 that this comes from a large proportion of learners who scored between 15 and 25 and a lower proportion who scored below 8 and above 25 in the post-tests assessment.

Figure 2: Distribution of pre- and post-course scores in reading for literacy learners

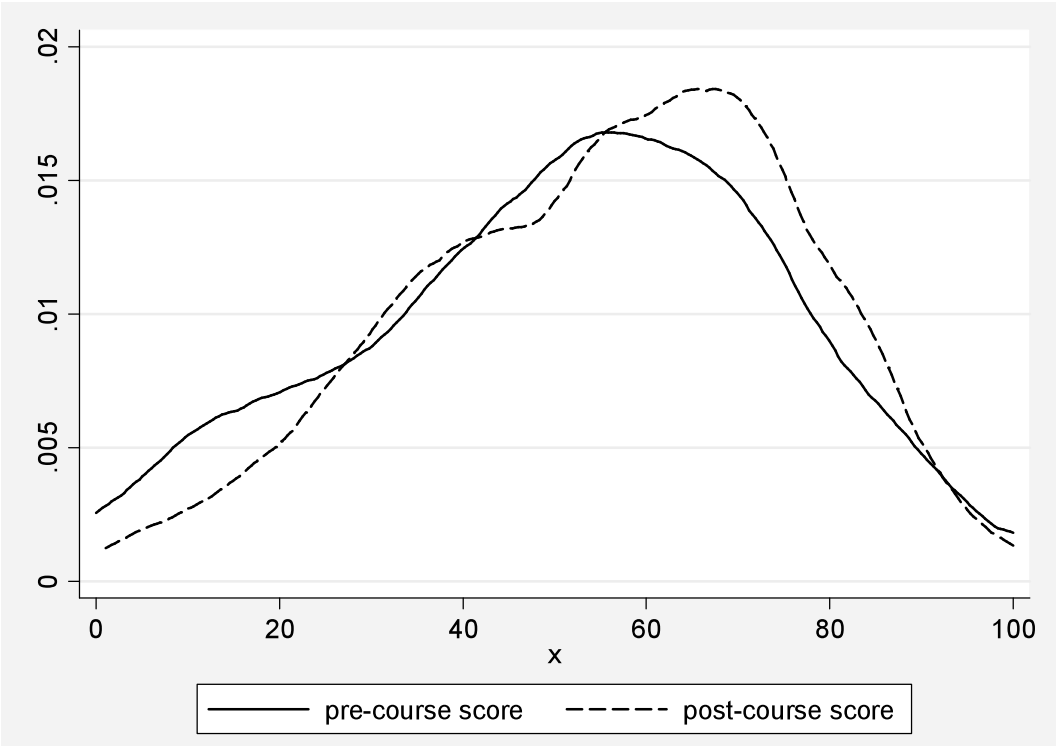


Figure 3: Distribution of pre- and post-course scores in reading for ESOL learners

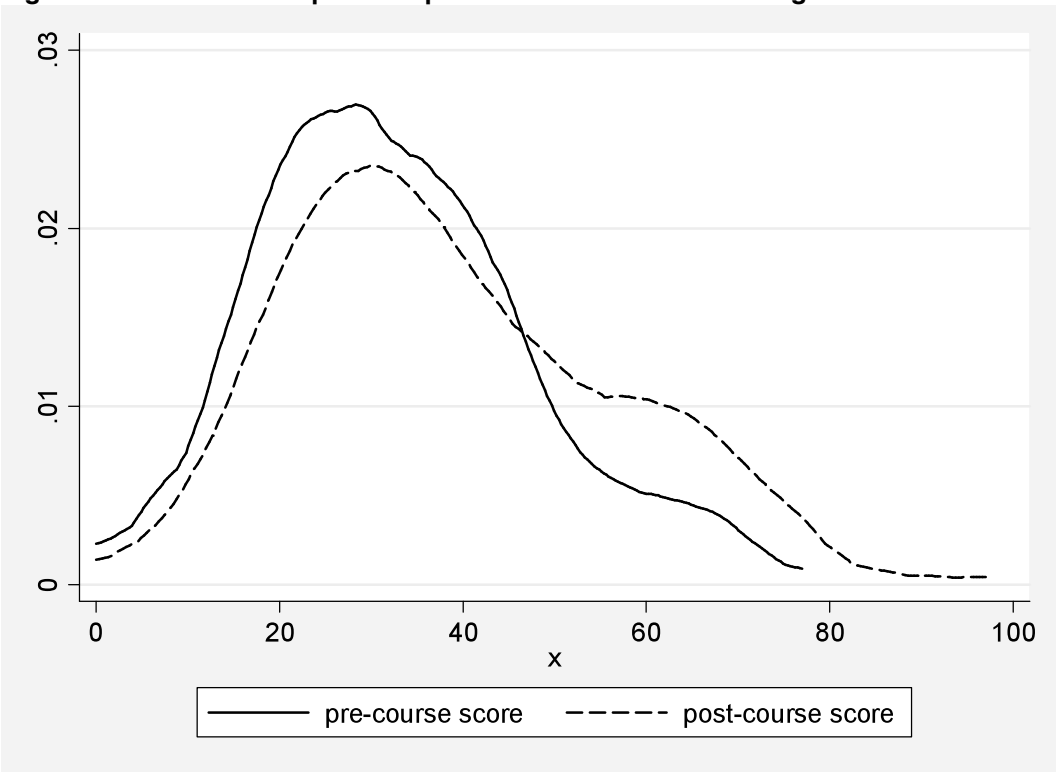


Figure 4: Distribution of pre- and post-course scores in writing for literacy learners

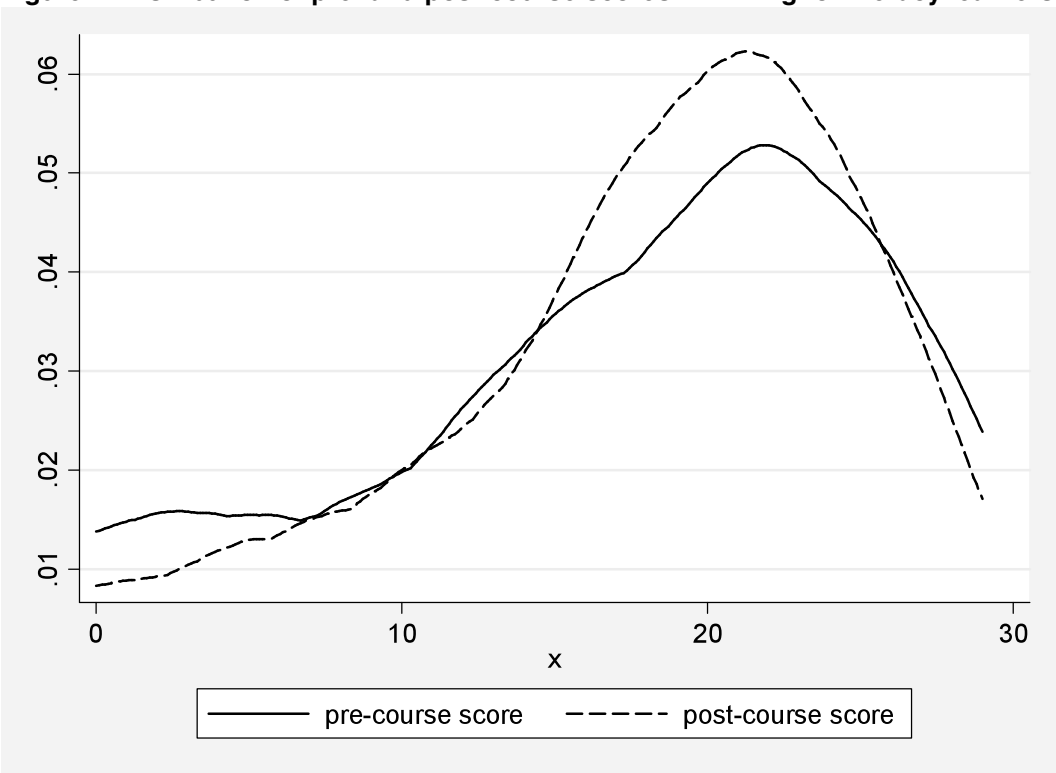


Figure 5: Distribution of pre- and post-course scores in writing for ESOL learners

2.3 Teachers' profiles

This section summarises the available information on teachers who participated in this study and the differences between the three subject area groups: literacy, numeracy and ESOL.

Table 3 shows that the numeracy group had a slightly higher proportion of male teachers among them compared to those for literacy and ESOL. ESOL teachers had a higher proportion of ethnic minorities among them and were slightly younger than literacy and numeracy teachers, whereas ESOL and numeracy teachers were slightly more experienced in teaching their subject than literacy teachers in this study.

Given that teachers' qualifications are at the centre of this study, it is important to devote more attention to the type of qualifications held and also to compare them according to their main area of teaching.

In general ESOL teachers appear overall to have higher qualifications compared to literacy and numeracy teachers.

We used three main categories to describe the qualification status of teachers: 'fully qualified', 'part qualified' and 'unqualified'. In this context, 'fully qualified' means teachers who have gained the two qualifications currently required, that is: a full generic teaching qualification (a Certificate in Education/PGCE or Certificate in Further Education Teaching Stage 3) and a subject-specialist qualification in literacy, numeracy or ESOL. 'Part-qualified' means that a teacher has one of the two qualifications required for teaching their subject (ESOL, literacy or

numeracy). 'Unqualified' means that a teacher has neither of the currently required qualifications. These 'unqualified' teachers may or may not have other qualifications, including 'legacy' qualifications. Legacy qualifications are those that pre-date the availability of currently required qualifications. Consequently, it should be noted that the subcategories of 'unqualified' teachers include a sizeable minority who have ESOL Diplomas at NQF Level 7 – teachers who could be thought of as very highly qualified indeed.

Of the three groups of teachers in this study, the ESOL group had the lowest proportion of fully-qualified staff. However, as mentioned previously, this picture of the ESOL workforce is biased by the 17.4 per cent of teachers qualified to NQF Level 7, who have to be represented as 'unqualified' as their qualifications do not precisely match the current standards. A higher number of teachers in literacy and numeracy held a subject specialism or generic teaching qualification compared to the ESOL teachers.

In general, less than a fifth of literacy and numeracy teachers were fully qualified to teach their corresponding subject, and for ESOL, less than a tenth. ESOL teachers, however, were better qualified in English. Indeed amongst ESOL teachers, 15.2 per cent had their only qualification at Level 2 or below compared to 35.1 per cent of literacy teachers. Furthermore, 44.1 per cent of numeracy teachers had their only qualification in mathematics at Level 2 or below.

Table 3: Teachers' characteristics

	Numeracy	Literacy	ESOL
N	84	94	92
Female	72.6	80.9	78.3
White British	96.4	97.9	87.0
Age (years)	45.2 (9.7)	45.7(10.4)	43.1(9.7)
Teaching experience in relevant subject (years)	7.1 (6.6)	6.2(4.9)	7.1(6.1)
Highest qualification overall			
Level 5 (Master's, PhD etc.)	26.2	18.1	35.9
Level 4 (undergraduate degree)	70.2	75.5	60.9
Level 3 or below	3.6	6.4	3.3
Highest qualification in maths			
Level 4–5	28.6	4.26	10.9
Level 3	27.4	17.0	19.6
Level 2 or below	44.1	78.7	69.6
Highest qualification in English			
Level 4–5	26.2	43.6	54.4
Level 3	16.7	21.3	30.4
Level 2 or below	57.1	35.1	15.2
Have a subject-specialist qualification in relevant subject	17.9	14.9	10.8 (48.9 – have a certificate in ESOL (e.g. CELTA) 17.4 – have a diploma in ESOL (e.g. DELTA)
Have a generic teaching qualification (e.g. CertEd; PGCE)	71.4	70.2	58.7
Fully qualified to teach a relevant subject	14.6	15.9	7.6
Part qualified to teach a relevant subject	52.5	62.8	58.7
Unqualified to teach a relevant subject	32.9	21.3	35.9

Notes: Figures in parenthesis are standard-deviations.

3. Main research findings

In the following chapter we will try to explain the variation in learners' literacy and numeracy test scores as well as their attitudes, after taking into account their skills and attitudes measured before or at the beginning of their course. We are therefore looking at learners' progress and change in attitudes related to teachers' qualifications. By including the pre-course tests measures, we controlled for the damaging effect of the inclusion of learners with differing abilities and/or skills in the different courses. Some teachers could have had a higher proportion of learners with low skills in their classrooms, or some providers located in more deprived areas might have had a disproportionably high number of learners with learning difficulties and thus lower skill levels. Also learners with given attitudes towards learning and their numeracy and/or literacy skills may not be randomly distributed. Introducing the initial measures allowed us to interpret the additional variables in the analysis as really related to the observed progress between the initial and final assessments.

As explanatory variables of main interest to this report, we use the qualifications of teachers. In most of the tables, we follow an approach where we start with one type of qualification and test its effect on the learners' performance. As we move to the right of the tables, we introduce other qualifications or qualifications in different combinations, each of which have been shown in published studies to be related to learners' achievement and/or attitudes. We also include those qualifications which are of particular interest for the current policy context.

First we introduce the level of teachers' highest qualification in general. For some, it was their teaching qualification (e.g. PGCE, DELTA etc.) and for others the highest qualification (master's, PhD etc.) related or not to their teaching (model 1). Then, while keeping the previous variable in our regressions, we introduced teachers' highest qualification in mathematics for numeracy teachers (Model 2, Table 4), in English for literacy teachers (Model 2, Table 5) and also in English for ESOL teachers (Model 2, Table 6).

Then in a subsequent step (Model 3, Tables 4, 5, 6), we introduce two variables. The first is whether the teacher holds a corresponding subject-specialist qualification and the second is whether s/he has a generic teaching qualification. To allow any effects of these qualifications to appear in learners' performance, we remove the highest qualification in English or Maths from these estimations. For ESOL teachers (Model 3, Table 6), we also test the effect of whether the teacher holds a CELTA and/or a DELTA qualification.

In Model 4 (Tables 4, 5, 6), rather than testing these two variables separately we introduce subcategories of qualified status in a corresponding subject – fully, partially and unqualified. Then in Model 5, we add the highest qualification in English or Maths together with qualification status of teachers. Finally in Model 6, we introduce teaching experience in the subject taught. From previous research we know that it is very hard to measure teaching quality. It is most probably wrong to assume that teaching quality is fully measured by the teaching qualifications. We therefore introduce teaching experience as an additional factor that is probably closely related to teaching quality. It is also interesting to see if

teaching experience can compensate for the lack of qualifications in teachers, and whether it increases learners' performance beyond the qualification status.

All the models in the following sections also include numerous controls for learners' characteristics (gender, age, first language, learning or health difficulties) and teachers' characteristics (age, gender, ethnicity). We do not give detailed comments on the effect of these variables as they are not the main focus of the study. However, they are reported fully in Appendix B.

3.1 Learners' progress

3.1.1 Progress in numeracy

Models 1 to 6 in Table 4 introduce the pre-course test score as the baseline in our regressions. We can observe the pre-course tests are always strongly statistically significant. In a related NRDC report using the same data, Brooks and Pilling (forthcoming 2009) have found that learners had indeed progressed in numeracy between the initial and later assessments. Our report's main focus is on the possible causal link between teachers' qualifications and their learners' progress. Once the initial assessments have been introduced to the regressions, it is then possible to interpret the other variables as related to the progress from the initial to the later assessments.

Our regressions control for the other characteristics of teachers and learners, most notably: the learners' and teachers' age and gender, learners' first language and learners' initial assessment in numeracy. We do not report their coefficients in Table 4 (they are reported in Appendix B), as we want to focus on the coefficients measuring teachers' qualifications.

First of all we include the highest overall qualification of teachers (Model 1). Its coefficient implies positive, but not statistically significant effects on learners' progress in numeracy. The level in maths for numeracy teachers is introduced in Model 2. The variables are whether the teacher holds an A level in maths and also whether s/he holds a degree or postgraduate degree in maths, and this is compared to teachers who hold a lower level in maths (GCSE or lower). Both coefficients are positive and strongly statistically significant. This means learners make more progress when their teachers have more than a GCSE level in maths.

Then these effects on learners' performance are assessed in comparison with those of a generic teaching qualification (e.g. CertEd, PGCE) and subject-specialist qualification. The data suggest that both qualifications, separately and in combination, have a positive but not statistically significant effect on learners' progress.

Table 4: Progress in numeracy

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Pre-course test score	0.809*** (0.051)	0.792*** (0.052)	0.808*** (0.053)	0.800*** (0.052)	0.787*** (0.053)	0.784*** (0.054)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate *(Reference category – lower level)*	1.244 (1.395)	1.121 (1.370)	1.230 (1.497)	0.927 (1.523)	0.885 (1.505)	0.388 (1.567)
Qualification in maths – degree or postgraduate degree *(Reference category – Level 2 or below)*		3.562** (1.598)			3.495** (1.677)	3.119* (1.762)
Qualification in maths at Level 3 (A level) *(Reference category – Level 2 or below)*		3.275** (1.447)			3.319** (1.556)	4.280*** (1.591)
Has a subject-specialist qualification in numeracy			0.074 (1.888)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.763 (1.497)			
Part qualified to teach numeracy *(Reference category – fully qualified)*				-1.325 (2.085)	-0.850 (2.079)	-0.879 (2.046)
Unqualified to teach numeracy *(Reference category – fully qualified)*				-2.321 (2.377)	-0.596 (2.442)	0.638 (2.547)
Teaching experience in numeracy (years)						0.215* (0.125)
Number of observations	237	237	237	237	237	225

Notes: Dependent variable: achievement in numeracy after the course.
Standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Finally in the last column (Model 6), the number of years teaching numeracy is introduced. It is found that learners make more progress when their teacher has greater experience at teaching the subject. This result is obtained controlling for teachers' levels in maths and teaching qualifications.

3.1.2 Progress of ESOL and literacy learners

For literacy and ESOL learners it appeared much harder to detect any statistically significant relationship between teachers' qualifications and learners' progress. However, the data suggest that learners make less progress in literacy if their teachers are part-qualified (have only a generic teaching qualification) compared to fully-qualified teachers (i.e. have both required teaching qualifications), as can be seen in Table 5, Models 4 to 6. We decided to combine the sample of learners who did the tests in reading and writing so as to maximise the sample size. We wanted to avoid that the lack of significance in the estimated coefficients originated comes from large standard errors due to our small samples. We therefore always introduced a dummy variable taking the value of 1 when the learners took the reading tests and 0 otherwise.

Table 5: Progress in literacy skills – literacy learners

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Pre-course test score	0.786*** (0.038)	0.785*** (0.038)	0.779*** (0.038)	0.775*** (0.038)	0.665*** (0.039)	0.770*** (0.038)
Whether took reading test (compared to writing test)	Y	Y	Y	Y	Y	Y
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-1.818 (1.811)	-1.884 (1.855)	-2.016 (1.843)	-1.997 (1.875)	-2.053 (1.963)	-2.086 (1.952)
Qualification in English – degree or postgraduate degree (Reference category – Level 2 or below)		1.141 (1.440)			1.001 (1.648)	0.895 (1.637)
Qualification in English at Level 3 (A level) *(Reference category – Level 2 or below)*		0.462 (1.900)			-0.209 (1.971)	0.477 (1.970)
Has a subject-specialist qualification in literacy			1.545 (2.024)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-1.497 (1.425)			
Part qualified – has a subject-specialist qualification in literacy only *(Reference category – fully qualified)*				-2.431 (4.475)	-3.950 (4.486)	-2.798 (4.559)
Part qualified – has a generic teaching qualification only *(Reference category – fully qualified)*				-3.266* (1.824)	-3.594* (1.985)	-3.098 (1.973)
Unqualified to teach literacy *(Reference category – fully qualified)*				-0.763 (2.143)	-0.534 (2.396)	-0.092 (2.398)
Teaching experience in literacy (years)						0.087 (0.155)
Number of observations	279	279	279	279	279	279

Notes: Dependent variable: combined achievement in reading and writing after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Here the samples of learners who did writing and reading tests were combined together. A dummy was added to take into account the fact that the two different tests were combined.

For ESOL learners (Table 6), no significant effects of qualifications can be detected within this data set. This does not necessarily imply that the qualifications have no effects on learners' progress, however. We have seen from the descriptive statistics in Table 3 that the sample of teachers is quite small (around 90) and some qualification levels are held by small proportions of them. This implies that our coefficients are not precisely estimated i.e. have large standard errors. Consequently, the size effects would have to be really large to be statistically significantly different from zero. But bearing in mind this caveat, we can say that we fail to find any significant effect of teachers' higher qualification for ESOL learners in those data.

Table 6: Progress in literacy (reading and writing) – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Pre-course test score	0.664***	0.652***	0.661***	0.658***	0.662***	0.650***	0.639***
	(0.050)	(0.051)	(0.050)	(0.051)	(0.050)	(0.051)	(0.051)
Whether took reading test (compared to writing test)	Y	Y	Y	Y	Y	Y	Y
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y	Y
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	0.157	1.288	0.640	0.498	0.769	1.838	2.265
	(1.858)	(2.110)	(1.898)	(2.072)	(1.880)	(2.172)	(2.230)
Qualification in English – degree or postgraduate degree		-0.723				-0.789	-0.434
		(2.744)				(2.832)	(2.891)
Qualification in English at Level 3 (A level)		2.173				1.813	1.830
		(2.914)				(2.898)	(2.945)
Has a subject-specialist qualification in ESOL		0.630	0.896				
		(3.203)	(3.338)				
Has a generic teaching qualification (e.g. PGCE, CertEd)		3.066	2.985				
		(2.021)	(2.092)				
Has a certificate in ESOL (e.g. CELTA)			-0.609				
			(2.041)				
Has a Diploma in ESOL (e.g. DELTA)			0.627				
			(2.547)				
With reference category as fully qualified:							
Part qualified – has a subject-specialist qualification in ESOL only					-7.479	-6.597	-7.413
					(5.028)	(5.259)	(5.387)
Part qualified – has a generic teaching qualification only					-1.558	-1.556	-1.864
					(3.889)	(4.018)	(4.093)
Unqualified to teach ESOL					-4.814	-5.010	-5.149
					(4.087)	(4.252)	(4.325)
Teaching experience in ESOL (years)							-0.185
							(0.164)
Number of observations	247	247	247	247	247	247	247

Notes: Dependent variable: combined achievement in reading and writing after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

3.2 Change in learners' self-confidence and other attitudes

In this section, the report includes additional investigations of the relationship between teachers' qualifications and learners' outcomes other than strict academic progress. In particular, other interesting and highly relevant questions for policy and practitioners were included in the questionnaire. Most notably, the learners' confidence and attitude towards their literacy and numeracy skills and/or use in their everyday life were recorded from the learners. Compared to the association between learners' progress and teachers' qualifications, results are less clear.

3.2.1 Change in attitudes of numeracy learners

Results of the analysis summarised in Table 7 suggest that learners tend to have a bigger improvement in attitudes towards daily use of maths[2] when their teachers have a degree or postgraduate degree in maths compared to those teachers who have a GCSE or lower level in maths (Models 1, 5 and 6). Yet, learners experience less improvement in their attitudes when their teachers have more teaching experience in numeracy (Model 6).

Table 7: Change in daily use of maths

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre-course attitudinal score	0.502*** (0.057)	0.508*** (0.056)	0.501*** (0.057)	0.499*** (0.057)	0.505*** (0.056)	0.519*** (0.058)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate *(Reference category – lower level)*	-0.193 (0.285)	-0.196 (0.272)	-0.278 (0.312)	-0.306 (0.316)	-0.258 (0.305)	-0.345 (0.308)
Qualification in maths – degree or postgraduate degree *(Reference category – Level 2 or below)*		0.932*** (0.324)			0.929*** (0.343)	1.056*** (0.337)
Qualification in maths at Level 3 (A level) *(Reference category – Level 2 or below)*		0.391 (0.291)			0.416 (0.316)	0.302 (0.311)
Has a subject-specialist qualification in numeracy			0.265 (0.389)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.098 (0.306)			
Part qualified to teach numeracy *(Reference category – fully qualified)*				-0.366 (0.423)	-0.178 (0.413)	-0.379 (0.390)
Unqualified to teach numeracy *(Reference category – fully qualified)*				-0.434 (0.480)	-0.062 (0.486)	-0.464 (0.486)
Teaching experience in numeracy (years)						-0.042* (0.024)
Number of observations	220	220	220	220	220	209

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.The dependent variable included the following statements in the questionnaire: I can use the maths I learn in class to help me solve everyday problems; I use maths a lot in my everyday life, including at home and/or work; Maths helps you to understand today's world; It is difficult to find a good job unless you have passed your maths.

[2] The scale was constructed using the following statements in the questionnaire: I can use the maths I learn in class to help me solve everyday problems; I use maths a lot in my everyday life, including at home and/or work; Maths helps you to understand today's world; It is difficult to find a good job unless you have passed your maths exams.

Another aspect of interest is whether learners tend to enjoy maths more or less at the end of the course[3]. The results in Table 8 suggest that learners tend to show a bigger improvement in enjoying maths when their teachers have a degree or postgraduate degree in maths compared to those teachers who have a GCSE or lower level in maths, and that maths enjoyment is decreased if the teacher is not fully qualified. The variable is not always significant and care should be taken in the interpretation of this latter result.

Table 8: Change in enjoying maths

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre-course attitudinal score	0.638*** (0.057)	0.641*** (0.057)	0.632*** (0.058)	0.628*** (0.057)	0.634*** (0.057)	0.610*** (0.061)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate *(Reference category – lower level)*	-0.060 (0.242)	-0.061 (0.237)	-0.168 (0.264)	-0.143 (0.268)	-0.111 (0.262)	-0.098 (0.315)
Qualification in maths – degree or postgraduate degree *(Reference category – Level 2 or below)*		0.500* (0.280)			0.377 (0.284)	0.389 (0.345)
Qualification in maths at Level 3 (A level) *(Reference category – Level 2 or below)*		0.110 (0.252)			-0.069 (0.264)	-0.044 (0.319)
Has a subject-specialist qualification in numeracy			0.288 (0.325)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.395 (0.262)			
Part qualified to teach numeracy *(Reference category – fully qualified)*				-0.234 (0.353)	-0.153 (0.344)	-0.141 (0.405)
Unqualified to teach numeracy *(Reference category – fully qualified)*				-0.720* (0.405)	-0.661 (0.410)	-0.802 (0.509)
Teaching experience in numeracy (years)						-0.008 (0.025)
Number of observations	236	236	236	236	236	225

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1
The dependent variable included the following statements in the questionnaire: I find learning maths boring (reverse item); The more you learn about maths, the more interesting it becomes; I enjoy learning maths.

On the other hand, an interesting and contrasting picture appears in the investigation of the effect of teachers' qualifications on learners' self-confidence (Table 9). Learners find maths more difficult after the course if the teacher has a degree or a postgraduate degree in maths compared to those teachers who have a GCSE or lower level in maths. This is an interesting result that relates to previously published studies lower outcomes for teachers who hold high-level qualifications (i.e. an over-qualification effect).

[3] The scale was constructed using the following statements in the questionnaire: I find learning maths boring (reverse item); The more you learn about maths, the more interesting it becomes; I enjoy learning maths.

Table 9: Change in self-confidence in maths

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre- course attitudinal score	0.573*** (0.055)	0.578*** (0.055)	0.577*** (0.055)	0.574*** (0.055)	0.580*** (0.055)	0.570*** (0.058)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate *(Reference category – lower level)*	0.072 (0.456)	0.095 (0.453)	0.114 (0.505)	0.049 (0.510)	-0.008 (0.508)	0.010 (0.573)
Qualification in maths – degree or postgraduate degree *(Reference category – Level 2 or below)*		-1.023* (0.542)			-0.970* (0.578)	-1.144* (0.641)
Qualification in maths at Level 3 (A level) *(Reference category – Level 2 or below)*		-0.503 (0.481)			-0.366 (0.524)	-0.454 (0.572)
Has a subject-specialist qualification in numeracy			-0.075 (0.631)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-0.552 (0.505)			
Part qualified to teach numeracy *(Reference category – fully qualified)*				-0.109 (0.684)	-0.357 (0.696)	-0.330 (0.738)
Unqualified to teach numeracy *(Reference category – fully qualified)*				0.585 (0.778)	0.173 (0.815)	0.529 (0.916)
Teaching experience in numeracy (years)						0.018 (0.046)
Number of observations	218	218	218	218	218	207

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1
The dependent variable is a scale constructed from the following statements in the questionnaire: I find lots of areas of maths difficult to understand; I find learning maths quite easy (reverse item); I usually get most of my maths questions right (reverse item); Many things we do in maths do not make sense to me; I often forget things that I have learnt in maths; Learning maths can make me feel that I am a bit of failure.

3.2.2 Change in attitudes of ESOL and literacy learners

There was no statistically significant effect of teachers' qualifications on change in the self-confidence[4] in their literacy skills for literacy learners (Table 10). For ESOL learners there is some evidence that learners experience increased self-confidence in their literacy skills if their teachers had a generic teaching qualification (Table 11). But this positive effect disappears once the effect of CELTA and DELTA qualifications is introduced. This may suggest that the CELTA and DELTA qualifications do not equip teachers with the skills to develop learners' confidence. But both in Tables 10 and 11, the effect of most teachers' qualifications is not significantly affecting changes in the dependent variables (learners' self-confidence).

[4] The scale is constructed from the following items. Confidence in: doing some reading; reading a set of instructions; writing in a class; writing at home; filling in forms; writing at work or in public places.

Table 10: Self-confidence in literacy skills – literacy learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre-course attitudinal score	0.746***	0.745***	0.743***	0.743***	0.742***	0.749***
	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)
Whether took reading test (compared to writing test)	-0.746*	-0.751*	-0.751*	-0.767*	-0.765*	-0.761*
	(0.447)	(0.447)	(0.448)	(0.450)	(0.450)	(0.450)
Learners' characteristics (gender, age, first language, health status)	✓	✓	✓	✓	✓	✓
Teachers' characteristics (gender, age, ethnicity)	✓	✓	✓	✓	✓	✓
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.604	-0.757	-0.601	-0.562	-0.734	-0.713
	(0.654)	(0.678)	(0.663)	(0.674)	(0.706)	(0.695)
Qualification in English – degree or postgraduate degree *(Reference category – Level 2 or below)*		0.074			-0.007	-0.120
		(0.520)			(0.577)	(0.572)
Qualification in English at level 3 (A level) *(Reference category – Level 2 or below)*		-0.759			-0.777	-0.784
		(0.721)			(0.735)	(0.726)
Has a subject-specialist qualification in literacy			0.517			
			(0.740)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.162			
			(0.506)			
Part qualified – has a subject-specialist qualification in literacy only *(Reference category – fully qualified)*				0.122	0.057	-0.037
				(1.510)	(1.535)	(1.520)
Part qualified – has a generic teaching qualification only *(Reference category - fully qualified)*				-0.291	-0.207	-0.283
				(0.627)	(0.673)	(0.664)
Unqualified to teach literacy *(Reference category – fully qualified)*				-0.447	-0.263	-0.166
				(0.737)	(0.826)	(0.816)
Teaching experience in literacy (years)						0.080
						(0.054)
Number of observations	280	280	280	280	280	280

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The dependent variable is constructed by including the following items. Confidence in: doing some reading; reading a set of instructions; writing in a class; writing at home; filling in forms; writing at work or in public places.

Table 11: Self-confidence in literacy skills – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Pre-course attitudinal score	0.574***	0.576***	0.567***	0.564***	0.571***	0.574***	0.573***
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)
Whether took reading test (compared to writing test)	0.189	0.172	0.178	0.165	0.207	0.185	0.180
	(0.488)	(0.490)	(0.489)	(0.488)	(0.492)	(0.493)	(0.494)
Learners' characteristics (gender, age, first language, health status)	✓	✓	✓	✓	✓	✓	✓
Teachers' characteristics (gender, age, ethnicity)	✓	✓	✓	✓	✓	✓	✓
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	-0.371	-0.431	-0.188	-0.039	-0.313	-0.352	-0.319
	(0.636)	(0.733)	(0.637)	(0.696)	(0.648)	(0.759)	(0.777)
Qualification in English – degree or postgraduate degree		0.704				0.595	0.631
		(0.931)				(0.958)	(0.981)
Qualification in English at Level 3 (A level)		0.619				0.574	0.584
		(0.981)				(0.979)	(0.995)
Has a subject-specialist qualification in ESOL			0.130	0.268			
			(1.124)	(1.155)			

Table 11: Self-confidence in literacy skills – ESOL learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Has a generic teaching qualification (e.g. PGCE, CertEd)			1.143* (0.675)	0.947 (0.696)			
Has a certificate in ESOL (e.g. CELTA)				-0.993 (0.682)			
Has a Diploma in ESOL (e.g. DELTA)				-0.300 (0.844)			
Reference category (fully qualified)							
Part qualified – has a subject-specialist qualification in ESOL only					0.620 (1.810)	0.588 (1.895)	0.551 (1.934)
Part qualified – has a generic teaching qualification only					1.114 (1.334)	1.142 (1.385)	1.110 (1.411)
Unqualified to teach ESOL					0.012 (1.400)	0.113 (1.464)	0.100 (1.489)
Teaching experience in ESOL (years)							-0.012 (0.056)
Number of observations	240	240	240	240	240	240	240

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
The dependent variable was constructed by including the following items. Confidence in: doing some reading; reading a set of instructions; writing in a class; writing at home; filling in forms; writing at work or in public places.

Some additional questions were introduced in the questionnaire in order to measure other aspects of learners' self-confidence. In particular, questions were asked on the confidence of learners towards their own learning ability and motivation[5]. The results displayed in Table 12 suggest that literacy learners experience a smaller increase in self-confidence in learning if their teachers have a generic teaching qualification. ESOL learners (Table 13) face decreased self-confidence related to learning if their teachers have their highest qualification at postgraduate level compared to all levels below that. This is some evidence again to support the assumption that over-qualified teachers tend to be associated with some negative outcomes such as confidence in learning. But not too strong policy conclusions should be drawn from this result, as we noted earlier that no such effect was observed for general self-confidence levels (in Tables 11 and 12).

Also, ESOL learners appear to become more confident in their learning ability if their teacher has a degree or a postgraduate degree in English compared to those teachers who have a GCSE or lower level in English (Models 2, 6 and 7 in Table 13).

[5] The question included for this analysis are: Confidence in: thinking about myself as a learner; having to take a test; thinking of going on another course.

Table 12: Self-confidence in learning – literacy learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre-course attitudinal score	0.509***	0.505***	0.506***	0.504***	0.501***	0.500***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Whether took reading test (compared to writing test)	-0.115	-0.114	-0.127	-0.111	-0.111	-0.111
	(0.178)	(0.178)	(0.175)	(0.176)	(0.176)	(0.176)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.258	-0.317	-0.313	-0.282	-0.334	-0.336
	(0.267)	(0.277)	(0.227)	(0.259)	(0.269)	(0.272)
Qualification in English – degree or postgraduate degree *(Reference category – Level 2 or below)*		-0.024			-0.083	-0.072
		(0.215)			(0.224)	(0.229)
Qualification in English at Level 3 (A level) *(Reference category – Level 2 or below)*		-0.377			-0.379	-0.383
		(0.292)			(0.283)	(0.285)
Has a subject-specialist qualification in literacy			0.120			
			(0.293)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-0.601***			
			(0.200)			
Part qualified – has a subject-specialist qualification in literacy only *(Reference category – fully qualified)*				0.928	0.919	0.924
				(0.594)	(0.603)	(0.607)
Part qualified – has a generic teaching qualification only *(Reference category – fully qualified)*				-0.404	-0.399	-0.393
				(0.250)	(0.268)	(0.272)
Unqualified to teach literacy *(Reference category – fully qualified)*				0.093	0.113	0.097
				(0.290)	(0.324)	(0.329)
Teaching experience in literacy (years)						-0.009
						(0.021)
Number of observations	285	285	285	285	285	285

Notes: Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 13: Self-confidence in learning – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Pre-course attitudinal score	0.396***	0.404***	0.388***	0.387***	0.392***	0.401***	0.403***
	(0.055)	(0.054)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
Whether took reading test (compared to writing test)	0.305	0.287	0.324	0.318	0.334	0.308	0.311
	(0.207)	(0.207)	(0.208)	(0.208)	(0.208)	(0.208)	(0.209)
Learners' characteristics (gender, age, first language, health status)	Y	Y	Y	Y	Y	Y	Y
Teachers' characteristics (gender, age, ethnicity)	Y	Y	Y	Y	Y	Y	Y
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	-0.418*	-0.546**	-0.329	-0.193	-0.378	-0.482*	-0.490*
	(0.235)	(0.267)	(0.235)	(0.255)	(0.235)	(0.275)	(0.278)
Qualification in English – degree or postgraduate degree		0.726**				0.611*	0.601*
		(0.345)				(0.356)	(0.362)
Qualification in English at Level 3 (A level)		0.534				0.499	0.508
		(0.358)				(0.358)	(0.361)
Has a subject-specialist qualification in ESOL			0.556	0.449			
			(0.425)	(0.428)			

Table 13: Self-confidence in learning – ESOL learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.389	0.406			
			(0.250)	(0.249)			
Has a certificate in ESOL (e.g. CELTA)				0.119			
				(0.249)			
Has a Diploma in ESOL (e.g. DELTA)				-0.407			
				(0.306)			
Reference category (fully qualified)							
Part qualified – has a subject-specialist qualification in ESOL only					0.547	0.471	0.493
					(0.668)	(0.692)	(0.701)
Part qualified – has a generic teaching qualification only					0.217	0.267	0.268
					(0.493)	(0.507)	(0.512)
Unqualified to teach ESOL					-0.237	-0.105	-0.108
					(0.512)	(0.532)	(0.537)
Teaching experience in ESOL (years)							0.006
							(0.020)
Number of observations	251	251	251	251	251	251	251

Notes: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4. Conclusions and implications

This report is able to make a number of distinctive and new claims with regard to the implementation of the Skills for Life strategy. Its main aim was to investigate how teachers' qualifications are related to learners' outcomes such as their levels in literacy and numeracy, their attitude to learning and their self-confidence. It made use of a comprehensive data set consisting of 760 learners whose teachers were interviewed as well (N=270). The learners were assessed twice, at the beginning and at the end of their course. This unusually rich source of information allowed for a careful and robust investigation of the main research question which were:

- Are teachers' qualifications related to improvement of learners between pre- and post-course assessments?
- Do such relationships differ according to the type of qualifications held?
- Are teachers' qualifications related to changes in learners' self-confidence and other attitudes?

The answer to the first question is a positive one. There is evidence that better qualified teachers have learners who improve more between the pre-course and post-course tests. But it is mostly in numeracy that the effect of qualified teachers was observed. Learners' improvements in numeracy were mostly due to more qualified teachers who held qualifications in maths at Level 3 and above (first or postgraduate degrees in maths). No effects on learners' attainment was detected for numeracy teachers holding qualifications at Level 2 (GCSE in maths) compared to those teachers who did not hold this qualification. No discernible effect of teachers' qualifications in numeracy was observed on the progress of learners. Number of years of teaching experience in numeracy was found to affect learners' improvements positively.

Little evidence supporting the effects of the level of teachers' qualifications in English could be detected on literacy and ESOL learners' improvements. There is, however, limited evidence that partly qualified teachers (those holding a generic qualification) tend to be associated with improved performance of their literacy learners between the pre- and post-assessments.

The second part of this report was devoted to the investigation of the link between higher qualifications of teachers and changes in learners' motivation and/or their self-confidence. The evidence of the effect of teachers' qualification is thin, but it is again in numeracy that the most qualification effects could be detected.

The picture that emerged is that learners tend to increase their use of maths more when they are taught by teachers who hold first or postgraduate degrees in maths. But there is a negative impact associated with the number of years of teaching experience. With regard to learners' enjoyment of using maths, there is limited evidence that teachers with a degree in maths tend to have a positive impact. The report provides more robust evidence showing that learners' self-

confidence is negatively affected by teachers highly qualified in maths (degree in maths or higher).

The report also investigated changes in attitudes and self-confidence for literacy and ESOL learners. There is only limited evidence that teachers with a generic teaching qualification (PGCE, CertEd) tend to improve the self-confidence of ESOL learners.

Finally, learners' confidence in their own learning ability and motivation was investigated. The effects of teachers' qualifications on this aspect of learners' confidence were positive when higher qualifications were held, in particular first and/or postgraduate degrees in English. This effect was observed for ESOL learners but not for literacy learners.

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Appendices

Appendix A: Teachers' and learners' characteristics

Table A 1: Learners' characteristics

	Reading		Writing	
	Literacy	**ESOL**	**Literacy**	**ESOL**
N	186	133	93	114
Age				
16–19	38.7	8.2	35.5	6.1
20–49	48.4	85.8	52.7	86.9
50+	12.9	6.0	11.8	7.0
Female	54.3	63.2	61.3	62.3
First language English	-	-	-	-
White British	88.2	-	94.6	-
Have dyslexia	23.1	1.0	23.7	2.6
Health-related problems	-	-	-	-
Highest qualifications				
Below Level 2	37.0	10.7	34.1	14.3
Level 2	28.7	17.4	23.1	15.3
Above Level 2	6.1	43.2	8.7	47.9
None	28.2	28.8	34.1	22.5
Other	-	-	-	-

Table A 2: Teachers' characteristics

	Reading		Writing	
	Literacy	**ESOL**	**Literacy**	**ESOL**
N	76	66	63	64
Female	81.6	73.9	85.7	81.3
White British	97.4	89.2	96.8	85.9
Age (years)	45.7 (10.5)	42.5 (9.9)	45.7 (10.6)	43.7 (9.8)
Teaching experience in relevant subject (years)	6.3 (4.8)	6.8 (5.7)	5.8 (4.7)	7.4 (6.5)
Highest qualification overall				
Level 5	18.4	38.5	19.1	37.5
Level 4	73.7	58.5	74.6	59.4
Level 3 or below	7.9	3.0	6.3	3.1
Highest qualification in maths				
Level 4–5	4.0	10.7	3.2	12.5
Level 3	15.8	20.0	19.1	15.6
Level 2 or below	80.2	69.3	77.7	71.9
Highest qualification in English				
Level 4–5	42.1	53.8	46.0	54.7
Level 3	19.7	33.9	19.1	28.1
Level 2 or below	38.2	12.3	34.9	17.2
Have a subject-specialist qualification in relevant subject	14.5	10.8 52.3 – have a certificate in ESOL (e.g. CELTA) 15.4 – have a diploma in ESOL (e.g. DELTA)	12.7	12.5 53.1 – have a certificate in ESOL (e.g. CELTA) 21.9 – have a diploma in ESOL (e.g. DELTA)

Table A 2: Teachers' characteristics (continued)

	Reading		Writing	
	Literacy	ESOL	Literacy	ESOL
Have a generic teaching qualification (e.g. CertEd,PGCE)	65.8	61.5	69.8	56.3
Fully qualified to teach a relevant subject	17.1	6.2	15.9	4.7
Part qualified to teach a relevant subject	59.2	59.9	58.7	59.4
Unqualified to teach a relevant subject	23.7	33.9	25.4	35.9

Appendix B (Same models as in the report but with all variables reported)

Table B 1: Progress in numeracy

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Constant	6.732	4.118	6.288	8.419	4.716	5.119
	(4.874)	(4.897)	(4.992)	(5.292)	(5.427)	(5.363)
Pre-course test score	0.809***	0.792***	0.808***	0.800***	0.787***	0.784***
	(0.051)	(0.052)	(0.053)	(0.052)	(0.053)	(0.054)
Learners' characteristics						
Learner is male	1.216	1.563	1.284	1.239	1.506	1.253
	(1.128)	(1.124)	(1.145)	(1.151)	(1.147)	(1.162)
Age 20–29	1.196	1.431	1.213	1.098	1.386	1.684
	(1.475)	(1.464)	(1.502)	(1.486)	(1.479)	(1.496)
Age 30–39	2.690	3.038*	2.658	2.518	2.989*	2.327
	(1.713)	(1.701)	(1.743)	(1.731)	(1.727)	(1.734)
Age 40–49	0.604	1.005	0.590	0.495	1.004	1.083
	(1.918)	(1.902)	(1.933)	(1.930)	(1.924)	(1.907)
Age 50+	3.036*	3.425*	2.952	2.745	3.363*	3.216*
	(1.838)	(1.828)	(1.872)	(1.872)	(1.877)	(1.877)
First language English	1.095	0.880	1.130	1.238	0.953	0.459
	(1.840)	(1.824)	(1.860)	(1.854)	(1.844)	(1.825)
Has health problems	-0.388	-0.734	-0.419	-0.543	-0.794	-1.145
	(1.338)	(1.333)	(1.359)	(1.352)	(1.346)	(1.353)
Has dyslexia	-0.736	-0.666	-0.656	-0.684	-0.701	-0.287
	(1.479)	(1.464)	(1.492)	(1.490)	(1.478)	(1.481)
Teachers' characteristics						
Teacher is male	0.184	0.941	0.248	0.311	0.932	0.841
	(1.437)	(1.448)	(1.461)	(1.460)	(1.469)	(1.523)
White British	-3.208	-1.756	-3.063	-2.765	-1.570	-1.115
	(3.204)	(3.190)	(3.279)	(3.282)	(3.264)	(3.172)
Age	0.025	0.009	0.019	0.014	0.011	-0.034
	(0.064)	(0.063)	(0.067)	(0.067)	(0.066)	(0.073)
	0.693	0.890	0.781	0.835	0.871	0.640
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	1.244	1.121	1.230	0.927	0.885	0.388
	(1.395)	(1.370)	(1.497)	(1.523)	(1.505)	(1.567)
Qualification in maths – degree or postgraduate degree		3.562**			3.495**	3.119*
		(1.598)			(1.677)	(1.762)
Qualification in maths at Level 3 (A level)		3.275**			3.319**	4.280***
		(1.447)			(1.556)	(1.591)

Table B 1: Progress in numeracy (continued)

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Has a subject-specialist qualification in numeracy			0.074			
			(1.888)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.763			
			(1.497)			
Reference category (fully qualified)						
Part qualified to teach numeracy				-1.325	-0.850	-0.879
				(2.085)	(2.079)	(2.046)
Unqualified to teach numeracy				-2.321	-0.596	0.638
				(2.377)	(2.442)	(2.547)
Teaching experience in numeracy (years)						0.215*
						(0.125)
Number of observations at Level 1 (learners)	237	237	237	237	237	225
Number of observations at Level 2 (teachers)	84	84	84	84	84	84
Intra-class correlation	11.8%	11.0%	12.8%	12.7%	11.9%	11.3%

Note: Dependent variable: achievement in numeracy after the course.
Standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 2: Progress in literacy skills – literacy course learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	43.082***	42.360***	44.743***	45.744***	44.959***	45.355***
	(6.480)	(6.724)	(6.589)	(6.621)	(6.977)	(7.046)
Pre-course test score	0.675***	0.674***	0.670***	0.667***	0.665***	0.662***
	(0.038)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
Whether took reading test (compared to writing test)	0.590	0.580	0.580	0.634	0.642	0.652
	(1.064)	(1.066)	(1.062)	(1.060)	(1.062)	(1.062)
Learners' characteristics						
Learner is male	-0.165	-0.213	-0.181	-0.166	-0.187	-0.218
	(1.095)	(1.099)	(1.095)	(1.092)	(1.096)	(1.098)
Age 20–29	-0.936	-1.033	-1.244	-1.047	-1.051	-0.961
	(1.617)	(1.631)	(1.641)	(1.642)	(1.654)	(1.666)
Age 30–39	-2.588	-2.599	-2.964*	-3.128*	-3.089*	-2.968*
	(1.748)	(1.756)	(1.780)	(1.765)	(1.779)	(1.801)
Age 40–49	-3.037*	-3.025*	-3.170*	-3.024*	-2.982*	-2.877
	(1.757)	(1.765)	(1.764)	(1.762)	(1.774)	(1.789)
Age 50+	-1.746	-1.607	-2.494	-2.542	-2.411	-2.459
	(1.862)	(1.876)	(1.924)	(1.896)	(1.918)	(1.926)
Has dyslexia	-0.687	-0.689	-0.814	-0.877	-0.867	-1.002
	(1.220)	(1.221)	(1.223)	(1.214)	(1.216)	(1.231)
Teachers' characteristics						
Teacher is male	-1.218	-1.170	-1.281	-0.943	-0.906	-0.803
	(1.801)	(1.849)	(1.819)	(1.831)	(1.889)	(1.914)
White British	-3.479	-2.856	-3.507	-3.461	-3.141	-3.240
	(4.657)	(4.741)	(4.695)	(4.757)	(4.839)	(4.898)
Age	-0.091	-0.098	-0.080	-0.068	-0.071	-0.084
	(0.063)	(0.065)	(0.064)	(0.066)	(0.067)	(0.071)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-1.640	-1.831	-1.868	-1.855	-2.053	-2.073
	(1.890)	(1.927)	(1.909)	(1.912)	(1.963)	(1.984)
Qualification in English – degree or postgraduate degree		1.247			1.001	0.952
		(1.501)			(1.648)	(1.668)
Qualification in English at Level 3 (A level)		-0.145			-0.209	-0.167
		(1.950)			(1.971)	(1.989)

Table B 2: Progress in literacy skills – literacy course learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Has a subject-specialist qualification in literacy			1.110			
			(2.039)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-2.104			
			(1.478)			
Reference category (fully qualified)						
Part qualified – has a subject-specialist qualification in literacy only				-3.760	-3.950	-4.143
				(4.443)	(4.486)	(4.522)
Part qualified – has a generic teaching qualification only				-3.996**	-3.594*	-3.713*
				(1.868)	(1.985)	(2.012)
Unqualified to teach literacy				-1.203	-0.534	-0.351
				(2.188)	(2.396)	(2.436)
Teaching experience in literacy (years)						0.101
						(0.159)
Number of observations at Level 1 (learners)	279	279	279	279	279	279
Number of observations at Level 2 (teachers)	94	94	94	94	94	94
Intra-class correlation	19.6%	20.3%	20.4%	21.1%	22.1%	23.1%

Notes: Dependent variable: combined achievement in reading and writing after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 3: Progress in literacy skills – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	31.085***	30.004***	31.821***	31.116***	33.400***	32.694***	32.970***
	(7.077)	(7.376)	(7.167)	(7.350)	(7.770)	(8.148)	(8.258)
Pre-course test score	0.735***	0.731***	0.738***	0.736***	0.742***	0.736***	0.733***
	(0.052)	(0.052)	(0.052)	(0.053)	(0.052)	(0.053)	(0.054)
Whether took reading test (compared to writing test)	-1.968	-2.078	-1.908	-1.897	-1.827	-1.938	-1.985
	(1.252)	(1.264)	(1.258)	(1.262)	(1.261)	(1.271)	(1.278)
Learners' characteristics							
Learner is male	-2.370*	-2.358*	-2.339*	-2.200	-2.331*	-2.332*	-2.337*
	(1.332)	(1.336)	(1.336)	(1.356)	(1.334)	(1.338)	(1.342)
Age 20–29	-5.415**	-5.407**	-5.533**	-5.481**	-5.859**	-5.982**	-5.865**
	(2.539)	(2.564)	(2.554)	(2.571)	(2.546)	(2.574)	(2.586)
Age 30–39	-4.772*	-4.827*	-4.959*	-4.914*	-5.398**	-5.574**	-5.456**
	(2.552)	(2.567)	(2.579)	(2.600)	(2.574)	(2.596)	(2.607)
Age 40–49	-6.313**	-6.450**	-6.396**	-6.339**	-6.626**	-6.861**	-6.719**
	(2.801)	(2.821)	(2.813)	(2.826)	(2.816)	(2.837)	(2.855)
Age 50+	-10.824***	-10.777***	-11.032***	-10.850***	-11.549***	-11.661***	-11.574***
	(3.303)	(3.323)	(3.328)	(3.353)	(3.330)	(3.360)	(3.369)
Has dyslexia	3.429	3.381	3.908	4.124	4.274	4.149	3.953
	(4.936)	(4.957)	(4.985)	(5.026)	(4.966)	(4.983)	(5.032)
Teachers' characteristics							
Teacher is male	1.060	1.027	0.916	0.766	0.782	0.901	0.761
	(2.019)	(2.074)	(2.058)	(2.137)	(2.096)	(2.171)	(2.233)
White British	1.189	1.285	0.856	0.683	0.463	0.505	0.541
	(2.390)	(2.413)	(2.448)	(2.486)	(2.414)	(2.430)	(2.454)
Age	-0.007	0.001	-0.010	-0.002	-0.013	-0.004	0.003
	(0.088)	(0.090)	(0.092)	(0.094)	(0.090)	(0.091)	(0.093)

Table B 3: Progress in literacy skills – ESOL learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	-0.028 (1.656)	0.369 (1.845)	-0.122 (1.699)	-0.428 (1.839)	-0.000 (1.671)	0.658 (1.880)	0.757 (1.919)
Qualification in English – degree or postgraduate degree		0.724 (2.400)				0.071 (2.453)	0.165 (2.490)
Qualification in English at Level 3 (A level)		1.849 (2.544)				1.819 (2.502)	1.782 (2.526)
Has a subject-specialist qualification in ESOL			1.154 (2.856)	1.126 (2.960)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-1.003 (1.817)	-0.802 (1.868)			
Has a certificate in ESOL (e.g. CELTA)				0.858 (1.813)			
Has a Diploma in ESOL (e.g. DELTA)				0.890 (2.265)			
Reference category (fully qualified)							
Part qualified – has a subject- specialist qualification in ESOL only					2.277 (4.481)	2.831 (4.562)	2.623 (4.649)
Part qualified – has a generic teaching qualification only					-2.631 (3.450)	-2.524 (3.463)	-2.529 (3.503)
Unqualified to teach ESOL					-1.357 (3.639)	-1.340 (3.675)	-1.309 (3.713)
Teaching experience in ESOL (years)							-0.051 (0.141)
Number of observations at Level 1 (learners)	247	247	247	247	247	247	247
Number of observations at Level 2 (teachers)	92	92	92	92	92	92	92
Intra-class correlation	23.1%	23.3%	23.5%	24.2%	21.0%	21.0%	21.9%

Notes: Dependent variable: combined achievement in reading and writing after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 4: Change in daily use of numeracy

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	7.741*** (1.195)	7.217*** (1.177)	7.636*** (1.218)	8.078*** (1.258)	7.301*** (1.262)	6.918*** (1.224)
Pre-course attitudinal score	0.502*** (0.057)	0.508*** (0.056)	0.501*** (0.057)	0.499*** (0.057)	0.505*** (0.056)	0.519*** (0.058)
Learners' characteristics						
Learner is male	0.117 (0.239)	0.185 (0.236)	0.100 (0.244)	0.095 (0.245)	0.163 (0.242)	-0.026 (0.243)
Age 20–29	-0.002	0.040	-0.031	-0.028	0.031	0.152

Table B 4: Change in daily use of numeracy (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(0.313)	(0.309)	(0.317)	(0.315)	(0.312)	(0.313)
Age 30–39	-0.004	-0.018	-0.039	-0.032	-0.015	-0.077
	(0.374)	(0.370)	(0.380)	(0.377)	(0.375)	(0.373)
Age 40–49	-0.105	-0.084	-0.122	-0.128	-0.084	-0.090
	(0.412)	(0.405)	(0.415)	(0.414)	(0.409)	(0.399)
Age 50+	0.735*	0.683*	0.679*	0.666	0.679*	0.613
	(0.402)	(0.399)	(0.410)	(0.411)	(0.410)	(0.408)
First language English	-0.588	-0.734**	-0.562	-0.563	-0.721*	-0.632*
	(0.377)	(0.372)	(0.380)	(0.379)	(0.376)	(0.370)
Has health problems	0.535*	0.474	0.509*	0.505*	0.465	0.431
	(0.294)	(0.290)	(0.296)	(0.296)	(0.293)	(0.296)
Has dyslexia	-0.420	-0.353	-0.422	-0.428	-0.371	-0.331
	(0.324)	(0.321)	(0.327)	(0.327)	(0.324)	(0.325)
Teachers' characteristics						
Teacher is male	-0.727**	-0.528*	-0.709**	-0.711**	-0.532*	-0.526*
	(0.293)	(0.289)	(0.297)	(0.297)	(0.293)	(0.289)
White British	-0.989	-0.677	-0.902	-0.873	-0.637	-0.682
	(0.637)	(0.621)	(0.653)	(0.655)	(0.635)	(0.591)
Age	-0.008	-0.012	-0.009	-0.009	-0.011	0.006
	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.014)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.193	-0.196	-0.278	-0.306	-0.258	-0.345
	(0.285)	(0.272)	(0.312)	(0.316)	(0.305)	(0.308)
Qualification in maths – degree or postgraduate degree		0.932***			0.929***	1.056***
		(0.324)			(0.343)	(0.337)
Qualification in maths at Level 3 (A level)		0.391			0.416	0.302
		(0.291)			(0.316)	(0.311)
Has a subject-specialist qualification in numeracy			0.265			
			(0.389)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.098			
			(0.306)			
Reference category (fully qualified)						
Part qualified to teach numeracy				-0.366	-0.178	-0.379
				(0.423)	(0.413)	(0.390)
Unqualified to teach numeracy				-0.434	-0.062	-0.464
				(0.480)	(0.486)	(0.486)
Teaching experience in numeracy (years)						-0.042*
						(0.024)
Number of observations at Level 1 (learners)	220	220	220	220	220	209
Number of observations at Level 2 (teachers)	78	78	78	78	78	73
Intra-class correlation	9.2%	6.5%	9.9%	9.9%	7.2%	3.2%

Note: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 5: Change in enjoying maths

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	5.780***	5.494***	5.569***	6.296***	6.069***	6.299***
	(1.013)	(1.019)	(1.016)	(1.058)	(1.077)	(1.210)
Pre-course attitudinal score	0.638***	0.641***	0.632***	0.628***	0.634***	0.610***
	(0.057)	(0.057)	(0.058)	(0.057)	(0.057)	(0.061)
Learners' characteristics						
Learner is male	-0.039	-0.004	-0.030	-0.007	0.018	0.009
	(0.217)	(0.218)	(0.219)	(0.220)	(0.220)	(0.236)

Table B 5: Change in enjoying maths (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age 20–29	-0.151	-0.157	-0.181	-0.175	-0.196	-0.128
	(0.290)	(0.289)	(0.292)	(0.290)	(0.289)	(0.311)
Age 30–39	-0.241	-0.253	-0.303	-0.296	-0.332	-0.230
	(0.338)	(0.338)	(0.340)	(0.338)	(0.339)	(0.364)
Age 40–49	0.127	0.141	0.092	0.092	0.080	0.154
	(0.388)	(0.387)	(0.387)	(0.386)	(0.386)	(0.410)
Age 50+	0.430	0.406	0.329	0.329	0.279	0.414
	(0.376)	(0.376)	(0.378)	(0.378)	(0.380)	(0.408)
First language English	-0.932***	-1.025***	-0.899***	-0.904***	-0.998***	-0.951***
	(0.348)	(0.349)	(0.347)	(0.346)	(0.347)	(0.369)
Has health problems	0.438*	0.408	0.399	0.402	0.385	0.385
	(0.259)	(0.259)	(0.260)	(0.259)	(0.259)	(0.274)
Has dyslexia	-0.073	-0.053	-0.035	-0.031	-0.012	-0.011
	(0.288)	(0.288)	(0.289)	(0.289)	(0.289)	(0.301)
Teachers' characteristics						
Teacher is male	-0.704***	-0.598**	-0.670***	-0.660***	-0.584**	-0.639**
	(0.254)	(0.257)	(0.253)	(0.253)	(0.252)	(0.304)
White British	-0.744	-0.599	-0.605	-0.614	-0.552	-0.600
	(0.559)	(0.557)	(0.561)	(0.562)	(0.552)	(0.634)
Age	-0.021*	-0.021*	-0.025**	-0.026**	-0.025**	-0.025*
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.015)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.060	-0.061	-0.168	-0.143	-0.111	-0.098
	(0.242)	(0.237)	(0.264)	(0.268)	(0.262)	(0.315)
Qualification in maths – degree or postgraduate degree		0.500*			0.377	0.389
		(0.280)			(0.284)	(0.345)
Qualification in maths at Level 3 (A level)		0.110			-0.069	-0.044
		(0.252)			(0.264)	(0.319)
Has a subject-specialist qualification in numeracy			0.288			
			(0.325)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.395			
			(0.262)			
Reference category (fully qualified)						
Part qualified to teach numeracy				-0.234	-0.153	-0.141
				(0.353)	(0.344)	(0.405)
Unqualified to teach numeracy				-0.720*	-0.661	-0.802
				(0.405)	(0.410)	(0.509)
Teaching experience in numeracy (years)						-0.008
						(0.025)
Number of observations at Level 1 (learners)	236	236	236	236	236	225
Number of observations at Level 2 (teachers)	83	83	83	83	83	78
Intra-class correlation	2.9%	1.7%	2.5%	2.5%	6.7%	9.6%

Note: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 6: Change in finding maths difficult

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	3.789**	4.405**	4.046**	3.547*	4.340**	4.857**
	(1.753)	(1.781)	(1.806)	(1.857)	(1.924)	(2.038)
Pre-course attitudinal score	0.573***	0.578***	0.577***	0.574***	0.580***	0.570***
	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.058)

Table B 6: Change in finding maths difficult (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Learners' characteristics						
Learner is male	-0.517	-0.568	-0.544	-0.580	-0.627	-0.597
	(0.400)	(0.400)	(0.407)	(0.409)	(0.409)	(0.428)
Age 20–29	0.446	0.414	0.447	0.449	0.412	0.229
	(0.501)	(0.501)	(0.508)	(0.505)	(0.506)	(0.528)
Age 30–39	0.243	0.247	0.254	0.266	0.263	0.059
	(0.591)	(0.593)	(0.600)	(0.596)	(0.600)	(0.624)
Age 40–49	1.130*	1.111*	1.145*	1.154*	1.131*	0.884
	(0.662)	(0.662)	(0.667)	(0.666)	(0.669)	(0.686)
Age 50+	-0.326	-0.293	-0.222	-0.247	-0.256	-0.403
	(0.641)	(0.646)	(0.657)	(0.656)	(0.664)	(0.688)
First language English	0.866	0.979	0.835	0.839	0.972	0.943
	(0.605)	(0.606)	(0.610)	(0.608)	(0.612)	(0.628)
Has health problems	-0.859*	-0.812*	-0.817*	-0.834*	-0.820*	-0.699
	(0.457)	(0.456)	(0.461)	(0.460)	(0.460)	(0.476)
Has dyslexia	0.685	0.606	0.659	0.649	0.574	0.723
	(0.521)	(0.520)	(0.523)	(0.522)	(0.523)	(0.537)
Teachers' characteristics						
Teacher is male	0.687	0.446	0.637	0.611	0.409	0.262
	(0.473)	(0.486)	(0.486)	(0.485)	(0.496)	(0.552)
White British	1.257	0.877	1.151	1.197	0.953	0.930
	(1.020)	(1.033)	(1.062)	(1.061)	(1.066)	(1.118)
Age	0.002	0.005	0.007	0.008	0.008	0.001
	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.026)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	0.072	0.095	0.114	0.049	-0.008	0.010
	(0.456)	(0.453)	(0.505)	(0.510)	(0.508)	(0.573)
Qualification in maths – degree or postgraduate degree		-1.023*			-0.970*	-1.144*
		(0.542)			(0.578)	(0.641)
Qualification in maths at Level 3 (A level)		-0.503			-0.366	-0.454
		(0.481)			(0.524)	(0.572)
Has a subject-specialist qualification in numeracy			-0.075			
			(0.631)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-0.552			
			(0.505)			
Reference category (fully qualified)						
Part qualified to teach numeracy				-0.109	-0.357	-0.330
				(0.684)	(0.696)	(0.738)
Unqualified to teach numeracy				0.585	0.173	0.529
				(0.778)	(0.815)	(0.916)
Teaching experience in numeracy (years)						0.018
						(0.046)
Number of observations at Level 1 (learners)	218	218	218	218	218	207
Number of observations at Level 2 (teachers)	79	79	79	79	79	74
Intra-class correlation	8.8%	8.3%	10.8%	10.6%	25%	13.8%

Note: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 7: Self-confidence in literacy skills – literacy learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	9.818***	10.046***	9.809***	10.195***	10.365***	10.287***
	(2.038)	(2.112)	(2.115)	(2.155)	(2.277)	(2.249)
Pre-course attitudinal score	0.746***	0.745***	0.743***	0.743***	0.742***	0.749***
	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)
Whether took reading test	-0.746*	-0.751*	-0.751*	-0.767*	-0.765*	-0.761*
(compared to writing test)	(0.447)	(0.447)	(0.448)	(0.450)	(0.450)	(0.450)
Learners' characteristics						
Learner is male	0.446	0.411	0.430	0.424	0.404	0.365
	(0.447)	(0.449)	(0.449)	(0.452)	(0.455)	(0.454)
Age 20–29	-0.373	-0.310	-0.436	-0.434	-0.335	-0.234
	(0.641)	(0.654)	(0.655)	(0.661)	(0.673)	(0.672)
Age 30–39	-0.129	-0.117	-0.200	-0.184	-0.151	-0.010
	(0.662)	(0.670)	(0.679)	(0.678)	(0.688)	(0.688)
Age 40–49	-0.322	-0.269	-0.334	-0.333	-0.268	-0.114
	(0.677)	(0.685)	(0.683)	(0.689)	(0.699)	(0.702)
Age 50+	0.224	0.301	0.206	0.154	0.238	0.262
	(0.721)	(0.731)	(0.764)	(0.764)	(0.775)	(0.770)
Has dyslexia	-0.977*	-0.955*	-1.011*	-1.008*	-0.968*	-1.047**
	(0.520)	(0.520)	(0.527)	(0.531)	(0.531)	(0.532)
Teachers' characteristics						
Teacher is male	1.052*	0.993	1.040*	1.087*	1.014	1.067*
	(0.592)	(0.633)	(0.601)	(0.612)	(0.653)	(0.644)
White British	-2.275	-2.255	-2.288**	-2.184	-2.235	-2.341
	(1.438)	(1.477)	(1.456)	(1.483)	(1.523)	(1.500)
Age	0.007	0.004	0.006	0.005	0.004	-0.006
	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.023)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.604	-0.757	-0.601	-0.562	-0.734	-0.713
	(0.654)	(0.678)	(0.663)	(0.674)	(0.706)	(0.695)
Qualification in English – degree or postgraduate degree		0.074			-0.007	-0.120
		(0.520)			(0.577)	(0.572)
Qualification in English at Level 3 (A level)		-0.759			-0.777	-0.784
		(0.721)			(0.735)	(0.726)
Has a subject-specialist qualification in literacy			0.517			
			(0.740)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.162			
			(0.506)			
Reference category (fully qualified)						
Part qualified – has a subject-specialist qualification in literacy only				0.122	0.057	-0.037
				(1.510)	(1.535)	(1.520)
Part qualified – has a generic teaching qualification only				-0.291	-0.207	-0.283
				(0.627)	(0.673)	(0.664)
Unqualified to teach literacy				-0.447	-0.263	-0.166
				(0.737)	(0.826)	(0.816)
Teaching experience in literacy (years)						0.080
						(0.054)
Number of observations at Level 1 (learners)	280	280	280	280	280	280
Number of observations at Level 2 (teachers)	93	93	93	93	93	93
Intra-class correlation	2.8%	4.4%	3.4%	4.1%	5.7%	4.7%

Notes: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 8: Self-confidence in literacy skills – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	11.107***	10.469***	10.643***	11.624***	10.809***	10.133***	10.167***
	(2.500)	(2.689)	(2.509)	(2.601)	(2.813)	(3.053)	(3.083)
Pre-course attitudinal score	0.574***	0.576***	0.567***	0.564***	0.571***	0.574***	0.573***
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)
Whether took reading test (compared to writing test)	0.189	0.172	0.178	0.165	0.207	0.185	0.180
	(0.488)	(0.490)	(0.489)	(0.488)	(0.492)	(0.493)	(0.494)
Learners' characteristics							
Learner is male	-0.253	-0.248	-0.254	-0.368	-0.272	-0.270	-0.276
	(0.531)	(0.533)	(0.530)	(0.536)	(0.532)	(0.535)	(0.536)
Age 20–29	-1.093	-1.033	-1.066	-1.016	-1.011	-0.960	-0.933
	(0.971)	(0.983)	(0.969)	(0.972)	(0.974)	(0.989)	(0.998)
Age 30–39	-0.535	-0.506	-0.521	-0.469	-0.508	-0.470	-0.441
	(0.980)	(0.988)	(0.986)	(0.991)	(0.991)	(1.002)	(1.009)
Age 40–49	0.149	0.180	0.129	0.120	0.206	0.234	0.266
	(1.079)	(1.088)	(1.078)	(1.080)	(1.087)	(1.098)	(1.106)
Age 50+	-0.466	-0.328	-0.513	-0.580	-0.507	-0.354	-0.302
	(1.302)	(1.311)	(1.302)	(1.307)	(1.309)	(1.322)	(1.326)
Has dyslexia	4.158**	4.170**	3.804**	3.686*	3.789*	3.800*	3.732*
	(1.923)	(1.939)	(1.927)	(1.936)	(1.938)	(1.958)	(1.985)
Teachers' characteristics							
Teacher is male	0.330	0.198	0.515	0.749	0.585	0.443	0.392
	(0.775)	(0.814)	(0.765)	(0.795)	(0.806)	(0.859)	(0.890)
White British	1.794*	1.912**	2.018**	2.178**	2.070**	2.162**	2.174**
	(0.918)	(0.948)	(0.912)	(0.928)	(0.929)	(0.963)	(0.977)
Age	-0.010	-0.011	-0.017	-0.028	-0.023	-0.023	-0.022
	(0.035)	(0.036)	(0.035)	(0.036)	(0.036)	(0.037)	(0.038)
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	-0.371	-0.431	-0.188	-0.039	-0.313	-0.352	-0.319
	(0.636)	(0.733)	(0.637)	(0.696)	(0.648)	(0.759)	(0.777)
Qualification in English – degree or postgraduate degree		0.704				0.595	0.631
		(0.931)				(0.958)	(0.981)
Qualification in English at Level 3 (A level)		0.619				0.574	0.584
		(0.981)				(0.979)	(0.995)
Has a subject-specialist qualification in ESOL			0.130	0.268			
			(1.124)	(1.155)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			1.143*	0.947			
			(0.675)	(0.696)			
Has a certificate in ESOL (e.g. CELTA)				-0.993			
				(0.682)			
Has a Diploma in ESOL (e.g. DELTA)				-0.300			
				(0.844)			
Reference category (fully qualified)							
Part qualified – has a subject- specialist qualification in ESOL only					0.620	0.588	0.551
					(1.810)	(1.895)	(1.934)
Part qualified – has a generic teaching qualification only					1.114	1.142	1.110
					(1.334)	(1.385)	(1.411)

Table B 8: Self-confidence in literacy skills – ESOL learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Unqualified to teach ESOL					0.012	0.113	0.100
					(1.400)	(1.464)	(1.489)
Teaching experience in ESOL (years)							-0.012
							(0.056)
Number of observations at Level 1 (learners)	240	240	240	240	240	240	240
Number of observations at Level 2 (teachers)	92	92	92	92	92	92	92
Intra-class correlation	19.1%	21.8%	17.0%	18.5%	17.6%	20.9%	22.4%

Notes: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 9: Self-confidence in learning – literacy learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	5.139***	5.337***	5.567***	5.375***	5.573***	5.573***
	(0.796)	(0.833)	(0.785)	(0.801)	(0.852)	(0.861)
Pre-course attitudinal score	0.509***	0.505***	0.506***	0.504***	0.501***	0.500***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Whether took reading test (compared to writing test)	-0.115	-0.114	-0.127	-0.111	-0.111	-0.111
	(0.178)	(0.178)	(0.175)	(0.176)	(0.176)	(0.176)
Learners' characteristics						
Learner is male	0.426**	0.417**	0.419**	0.409**	0.402**	0.405**
	(0.178)	(0.178)	(0175)	(0.176)	(0.177)	(0.177)
Age 20–29	0.214	0.229	0.151	0.127	0.153	0.137
	(0.264)	(0.268)	(0.262)	(0.263)	(0.266)	(0.268)
Age 30–39	-0.049	-0.054	-0.124	-0.120	-0.123	-0.141
	(0.266)	(0.270)	(0.264)	(0.262)	(0.266)	(0.270)
Age 40–49	0.022	0.025	0.007	0.003	0.006	-0.011
	(0.270)	(0.274)	(0.263)	(0.264)	(0.268)	(0.272)
Age 50+	0.259	0.264	0.010	0.033	0.046	0.044
	(0.282)	(0.285)	(0.289)	(0.286)	(0.291)	(0.292)
Has dyslexia	-0.955***	-0.948***	0.694	-1.026***	-1.016***	-1.003***
	(0.199)	(0.199)	(0.817)	(0.199)	(0.199)	(0.200)
Teachers' characteristics						
Teacher is male	0.009	-0.041	0.034	0.026	-0.043	-0.050
	(0.248)	(0.265)	(0.237)	(0.240)	(0.256)	(0.260)
White British	-0.638	-0.615	-0.719	-0.684	-0.678	-0.657
	(0.598)	(0.618)	(0.574)	(0.580)	(0.594)	(0.603)
Age	-0.002	-0.004	0.002	0.001	-0.001	0.000
	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)
Teachers' qualifications						
Highest level qualification – postgraduate degree, doctorate	-0.258	-0.317	-0.313	-0.282	-0.334	-0.336
	(0.267)	(0.277)	(0.227)	(0.259)	(0.269)	(0.272)
Qualification in English – degree or postgraduate degree		-0.024			-0.083	-0.072
		(0.215)			(0.224)	(0.229)

Table B 9: Self-confidence in learning – literacy learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Qualification in English at Level 3 (A level)		-0.377			-0.379	-0.383
		(0.292)			(0.283)	(0.285)
Has a subject-specialist qualification in literacy			0.120			
			(0.293)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			-0.601***			
			(0.200)			
Reference category (fully qualified)						
Part qualified – has a subject-specialist qualification in literacy only				0.928	0.919	0.924
				(0.594)	(0.603)	(0.607)
Part qualified – has a generic teaching qualification only				-0.404	-0.399	-0.393
				(0.250)	(0.268)	(0.272)
Unqualified to teach literacy				0.093	0.113	0.097
				(0.290)	(0.324)	(0.329)
Teaching experience in literacy (years)						-0.009
						(0.021)
Number of observations at Level 1 (learners)	285	285	285	285	285	285
Number of observations at Level 2 (teachers)	95	95	95	95	95	95
Intra-class correlation	5.1%	7.5%	3.1%	3.6%	5.1%	5.7%

Notes: dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B 10: Self-confidence in learning – ESOL learners

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	4.852***	4.248***	4.837***	4.757***	5.063***	4.375***	4.361***
	(0.942)	(1.007)	(0.942)	(0.964)	(1.038)	(1.133)	(1.140)
Pre-course attitudinal score	0.396***	0.404***	0.388***	0.387***	0.392***	0.401***	0.403***
	(0.055)	(0.054)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
Whether took reading test (compared to writing test)	0.305	0.287	0.324	0.318	0.334	0.308	0.311
	(0.207)	(0.207)	(0.208)	(0.208)	(0.208)	(0.208)	(0.209)
Learners' characteristics							
Learner is male	0.265	0.290	0.270	0.238	0.260	0.282	0.287
	(0.223)	(0.223)	(0.222)	(0.224)	(0.222)	(0.223)	(0.224)
Age 20–29	0.617	0.688*	0.586	0.543	0.612	0.681*	0.672
	(0.408)	(0.409)	(0.407)	(0.406)	(0.407)	(0.411)	(0.415)
Age 30–39	0.602	0.616	0.534	0.477	0.534	0.575	0.566
	(0.412)	(0.413)	(0.414)	(0.414)	(0.415)	(0.418)	(0.422)
Age 40–49	0.340	0.367	0.305	0.266	0.339	0.367	0.354
	(0.455)	(0.455)	(0.454)	(0.453)	(0.456)	(0.458)	(0.462)
Age 50+	0.326	0.399	0.250	0.174	0.229	0.329	0.332
	(0.552)	(0.551)	(0.553)	(0.554)	(0.556)	(0.559)	(0.561)

Table B 10: Self-confidence in learning – ESOL learners (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Has dyslexia	0.754	0.785	0.708	0.654	0.670	0.685	0.717
	(0.819)	(0.817)	(0.821)	(0.822)	(0.823)	(0.825)	(0.834)
Teachers' characteristics							
Teacher is male	0.179	0.049	0.230	0.207	0.297	0.163	0.184
	(0.284)	(0.296)	(0.279)	(0.282)	(0.293)	(0.313)	(0.324)
White British	0.110	0.209	0.164	0.163	0.197	0.278	0.277
	(0.345)	(0.351)	(0.343)	(0.342)	(0.349)	(0.358)	(0.361)
Age	-0.002	-0.003	-0.007	-0.005	-0.009	-0.009	-0.010
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
Teachers' qualifications							
Highest level qualification – postgraduate degree, doctorate	-0.418*	-0.546**	-0.329	-0.193	-0.378	-0.482*	-0.490*
	(0.235)	(0.267)	(0.235)	(0.255)	(0.235)	(0.275)	(0.278)
Qualification in English – degree or postgraduate degree		0.726**				0.611*	0.601*
		(0.345)				(0.356)	(0.362)
Qualification in English at Level 3 (A level)		0.534				0.499	0.508
		(0.358)				(0.358)	(0.361)
Has a subject-specialist qualification in ESOL			0.556	0.449			
			(0.425)	(0.428)			
Has a generic teaching qualification (e.g. PGCE, CertEd)			0.389	0.406			
			(0.250)	(0.249)			
Has a certificate in ESOL (e.g. CELTA)				0.119			
				(0.249)			
Has a Diploma in ESOL (e.g. DELTA)				-0.407			
				(0.306)			
Reference category (fully qualified)							
Part qualified – has a subject-specialist qualification in ESOL only					0.547	0.471	0.493
					(0.668)	(0.692)	(0.701)
Part qualified – has a generic teaching qualification only					0.217	0.267	0.268
					(0.493)	(0.507)	(0.512)
Unqualified to teach ESOL					-0.237	-0.105	-0.108
					(0.512)	(0.532)	(0.537)
Teaching experience in ESOL (years)							0.006
							(0.020)
Number of observations at Level 1 (learners)	251	251	251	251	251	251	251
Number of observations at Level 2 (teachers)	94	94	94	94	94	94	94
Intra-class correlation	6.3%	7.5%	4.7%	3.2%	4.7%	6.7%	7.4%

Notes: Dependent variable: attitudes after the course.
Robust standard errors (clustered by teacher) in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

