





Choosing to read – what the evidence tells us...

Literacy and numeracy are critical skills for pupils to develop if they are to reach their potential and achieve rewarding outcomes during and after education. Liz Twist highlights the evidence showing why reading – including reading out loud – must be at the heart of the curriculum in the primary years

hildren who enjoy reading tend to read more frequently than those who don't – and they are better at it.

There's nothing unexpected in that statement and nothing to disagree with. We can always find exceptions but, yes, it's a virtuous circle. Reading is generally accepted to be "a good thing", and each time a child chooses to curl up with a book, they are practising and improving their reading skills.

The national curriculum in England is explicit: "All pupils must be encouraged to read widely across both fiction and non-fiction to develop their knowledge of themselves and the world in which they live, to establish an appreciation and love of reading, and to gain knowledge across the curriculum." (DfE, 2014)

Reading – what the evidence says

The American psychologist Keith Stanovich (1986) coined the term the Matthew Effect to describe the reciprocal relationship between the development of reading comprehension and the development of vocabulary knowledge.

The term is referring back to the Bible passage in which the richget-richer and the poor-get-poorer. Cunningham and Stanovich (2001) explored the differential amount of practice in reading children get and how this contributes to the reciprocal relationship between reading and not just vocabulary but also background knowledge, familiarity with syntax, and so on.

In a British context, data from the 1970 British Cohort Study shows how reading leads not only to improvements in vocabulary and hence better reading but has an even wider effect. Using the data from this longitudinal study, Sullivan and Brown (2013) found an impact of voluntary reading beyond that of developing better reading skills.

They found that frequency of reading for pleasure was linked to increases in the rate of cognitive progress over time. So while reading makes children better at reading, it has an even greater significance. It is linked to improvements in other skills that are important to success - in school and in life. And these skills aren't just those which we might intuitively associate with reading, such as vocabulary, but also others, such as mathematics. This has implications across the school, for all year groups and all abilities.

Reading for enjoyment

A well-known study by McKenna, Kear and Ellsworth (1995) looked at attitudes to reading among US elementary-aged pupils and found that there was a steady fall in interest from Grade 1 to Grade 6 among pupils of all abilities.

There were positive attitudes from most pupils in the youngest grade, with similar measures across high, medium and low ability groups. By Grade 6 not only were attitudes in each group much less positive, but the differences in attitudes had become more marked, with lower attaining pupils having much less positive attitudes than higher attaining pupils.

"While reading makes children better at reading, it has an even greater significance. It is linked to improvements in other skills that are important to success. And these skills aren't just those which we might intuitively associate with reading, such as vocabulary, but also others, such as mathematics"

In addition, there was a wide gender difference, with boys much less engaged than girls - boys had a lower engagement level at the start and the gap had widened substantially by Grade 6.

Given that McKenna et al noted that enjoyment in reading was at its peak at the start of schooling and fell with increasing age (and presumably growing reading competence), it seems reasonable to recognise it as a whole-school issue.

More recent data from the OECD's 2016 Progress in International Reading Literacy Study (PIRLS) endorses the links between reading competence, reading engagement and frequency of reading (Mullis et al, 2017). Across almost all participating countries, higher reading performance within a country is associated with greater enjoyment of reading and reading more frequently. This isn't just an issue in England

What reading offers

In a rare moment of lively prose, the national curriculum points out that: "Reading ... feeds pupils' imagination and opens up a treasurehouse of wonder and joy for curious young minds.

Sullivan et al (2013) emphasised the impact reading for pleasure had on children and young people's vocabulary scores – and the contrast between the complexity of vocabulary used in written texts compared to the spoken word is well-established.

Cunningham and Stanovich (2001) compared the relative complexity of spoken and written speech, describing the former as "lexically impoverished". They emphasised the vast range in the amount of words children who read out of school are exposed to, depending on the volume of their reading.

So what can school leaders do?

There are enormous pressures on schools to ensure pupils make progress and are happy, engaged and challenged learners. What can schools do that does not add to the pressures they are already under?

Ofsted's Bold Beginnings report (2017) put language and literacy at the heart of the curriculum for the Reception year. But it is not just needed at the heart of the curriculum for the youngest children in school. There are ways of putting reading at the heart of every classroom.

Reading aloud - not just while children are in the early stages of learning to read – fulfils the vital task of exposing children to books that they are, as yet, unable to read independently. Books they hear should be those that they would not otherwise come across or that they could not read themselves, that give them a flavour of the world of books that lies ahead of them.

This is clearly stated in the national curriculum and its statutory requirements for years 3 and 4, and years 5 and 6: "Pupils should be taught to ... participate in discussion about both books that are read to them and those they can read for themselves." (DfE, 2013)

Sometimes it can be tempting to choose the "easy win" books – few children dislike Roald Dahl's creations. But the most effective approach will be to read books that will expand children's horizons – stories that they aspire to read but can't yet or non-fiction books providing information that builds on what they already know rather than just

reinforcing existing knowledge. To engage those 20 per cent of children in the PIRLS 2016 study who said that they didn't like reading and rarely read outside school, perhaps sharing a great story or a fascinating information book will show them what they're missing – particularly if they're not going to pick up a book voluntarily.

The importance of school leaders encouraging this passion for reading throughout the school shouldn't be overestimated. The evidence shows us how reading fully justifies its place at the heart of the

• Liz Twist is head of assessment research at the National Foundation for Educational Research (NFER).

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Interpreting the outcomes of standardised tests

Many schools use standardised tests as part of their assessment practices. To help you get the most out of standardised tests, Liz Twist outlines some of the key terms and information

housands of primary schools choose to use standardised tests as part of their approach to assessment. For many, the benefit lies in the reliable outcomes, the results of the tests having been trialled with a large nationally representative sample during development. Standardised tests also enable pupil performance to be benchmarked against the national average and meaningfully compared with other pupils and standardised scores from other tests.

While most tests will provide a raw score (the actual mark or score obtained by a pupil), these do not enable meaningful comparisons between tests or between pupils. From standardised tests there are at least three further outcomes that can be obtained: standardised scores, agestandardised scores, and age-related expectations.

It is easy to confuse standardised scores with scaled scores, and to misinterpret the results without appreciating the role that confidence bands have to play. To help you get the most out of standardised tests, below is an outline of the key terms you need to know.

Department for Education scaled scores

At the end of key stage 1 or key stage 2, the scaled score of 100 on the national curriculum tests represents the "expected standard" as defined by the Department for Education (DfE). This is not the average and is not the same as, nor equivalent to, a standardised score of 100. For standardised tests, a score of 100 represents the average performance, based on a normal distribution, of the sample of pupils on which the tests were standardised.

Standardised scores

Standardised scores compare a pupil's performance to that of a nationally representative sample of pupils from the relevant year group, who will have all taken the same test at the same time of year.

The average score on most standardised tests is 100. Technically a score above 100 is above average and a score below 100 is below average. About two-thirds of pupils will have standardised scores between 85 and 115. Almost all pupils fall within the range 70 to 140, so scores outside this range can be regarded as exceptional.

If you wish to group pupils according to standardised (or agestandardised) scores, the following descriptions may be useful. These may vary between test providers, but this example from NFER tests gives you an idea of what the range of scores may mean:

Below 70	70-84	85-94	95-104	105-114	115-129	Above 129
well	below	low	average	high	above	well
below	average	average		average	average	above
average						average

Confidence bands

Confidence bands (sometimes called confidence intervals) are used to show the extent of the margin of error in the standardised scores. In other words, how accurately the test measures a pupil's attainment. The margin of error is simply a statistical estimate, based on the fact that tests can only sample the particular area of learning which they assess and therefore the score a pupil achieves may vary within a few points of their "true score". In NFER tests, to indicate how wide this margin of error is likely to be, a "90 per cent confidence band" has been calculated. This means that you can have 90 per cent certainty that the true score lies within the confidence band.

Age-standardised scores

These follow the same principle as standardised scores in that they are comparing performances of pupils based on their raw (total) score. However, age-standardised scores take the pupil's age into account and compare their performance with that of pupils of the same age at the time of testing (in years and months). Again, this uses information derived from the large scale trial. In practice, age-standardised scores mean that, with two pupils who have the same raw score, it is likely that the younger pupil will have a higher age-standardised score.

Age-related expectations

The Standards and Testing Agency (STA) scaled score of 100 on the year 2 and year 6 national curriculum tests represents the "expected standard" for the end of the relevant key stage. It is inappropriate to apply this standard to tests in other year groups when pupils have not been taught all the relevant content.

Instead, in order to provide a curriculum-related outcome, some standardised test providers undertake a standard setting exercise. NFER uses "bookmarking", an internationally recognised procedure that combines statistical information from the large scale trial with the judgements of groups of teachers who scrutinise the new assessments.

As part of this exercise at NFER, teachers worked with the test developers to identify the knowledge, skills and understanding that can be expected by the end of a given year, in the 2014 national curriculum. This information was combined with statistical information from the large trial to arrive at a guide to the number of marks a pupil needs to achieve on a particular test in order to have achieved an appropriate standard on the curriculum, given that they are part way through the programme of study. A range of marks, rather than a definitive mark, is

Continuing with bookmarking, teachers also scrutinised the tests to look at high achievement and this was combined with the statistical information to arrive at a range of marks. This range, generally of three or four marks, gives an indication of a pupil's standard of achievement not in comparison to his or her peers (which is what standardised scores do) but in relation to the expectations of the national curriculum for that

In NFER's view, it is important that teachers use their professional judgement when interpreting test outcomes and for this reason a range of marks is used to suggest where the age-related threshold lies.

An example of how to interpret results

Emma's date of birth is November 27, 2008, and she took the year 4 summer maths test on June 12, 2017, scoring 64.

Jay, whose date of birth is March 3, 2009, took the same test on the same day and scored 68.

Emma's standardised score is 109. With a confidence interval of -5 and +4, there is a 90 per cent likelihood of her "true" score being between 104 and 113 and her performance on the test could broadly be described as

Jay's raw score of 68 converts to a standardised score of 111 which is also "high average". The confidence band around Jay's score (also -5 and +4) indicates that his "true" score has a 90 per cent likelihood of being between 106 and 115.

Their age-standardised scores are 114 for Emma and 118 for Jay. This takes into account the difference in their ages.

A total score of 64 suggests that Emma is comfortably reaching agerelated expectations as measured by the summer year 4 maths test. Jay's 68 suggests that his teacher should consider whether other evidence of his work supports a grading of "high achievement" as he is at the borderline between the age-related expectation and the high achievement band.

"Standardised tests should form just one part of a school's approach to assessment, with on-going formative assessment informing teaching throughout the year"

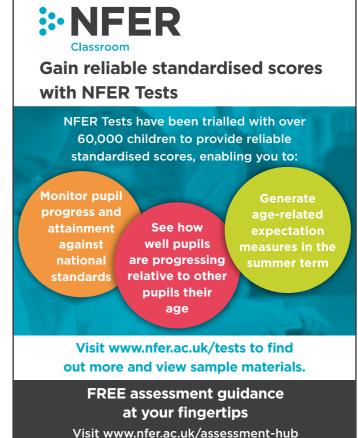
Conclusion

By utilising standardised tests and applying their own professional judgements when interpreting the results, teachers can build a profile of attainment and progress for their pupils and be confident in their conclusions and next steps. Standardised tests should form just one part of a school's approach to assessment, with on-going formative assessment informing teaching throughout the year. But when it comes to choosing summative assessments to assess learning at the end of a teaching period, high-quality standardised tests can ensure the data gained is reliable and meaningful.

• Liz Twist is head of assessment research and product development at the National Foundation for Educational Research (NFER).

Further information

If you found this valuable and would like further guidance to help the teachers in your school to brush up on their understanding of assessment, there is a wealth of free support on the NFER website. You can also sign up to receive a series of free assessment guides direct to your inbox this autumn. Visit www.nfer.ac.uk/assessment-hub



to discover a wealth of free, digestible

guidance on primary assessment.



Making the most of assessment data

Collecting assessment data is easy – but with so much data available, collecting the right information and ensuring you are using it effectively to support pupils' learning can be more difficult. Emily Jones explains

ith the end of the academic year fast approaching, schools across the country will have their summative assessment processes well underway.

However, while it is relatively easy to collect assessment data, interpreting it can be harder. Schools hold and generate a large amount of data. In order to make the most of it, teachers need to know what data they have, how to interpret it and, crucially, how best to use it to promote further learning.

What data are schools likely to have?

In terms of numerical or statistical attainment data, there are several types which schools commonly collect. These include individual raw scores, standardised scores or scaled scores from national or optional assessments, information drawn from question-level analysis of tests, and teacher assessment data expressed numerically. Schools are also likely to have background data on pupils, which can be used to analyse and compare attainment of particular groups, such as boys and girls or eligibility for Pupil Premium.

When used effectively, data is valuable in enabling schools to highlight gaps in attainment, identify patterns of achievement and make insightful comparisons. For example, by comparing pupils' standardised scores over time, schools are able to identify pupils making more, the same or less progress than the national average. These scores can also be used to compare pupil attainment and progress across different subjects.

Despite the opportunities that data offers schools in terms of improving teaching and learning, it is important to remember that data recording and tracking should not be burdensome and all data recorded should have a useful purpose.

As Sean Harford, the national director for education at Ofsted, warned in a recent blog post, an over-reliance on "meaningless data" is currently the biggest flaw in assessment across schools (April 2018).

He writes: "I think there is too much marking being expected compared with the resultant benefits to pupils' learning; too much reliance on meaningless data; and too little meaningful assessment of the right things at the right point in the curriculum."

Schools should therefore ensure that any assessment information collected can be used to support better pupil achievement.

With this in mind, schools may want to consider the following when collecting and recording assessment data:

- Rationalise the data you record to make sure it meets your needs.
- Ensure that you comply with legal requirements such as those in the General Data Protection Regulation (GDPR).
- Centralise responsibility for managing the school's database and entering data to make the process more efficient and to minimise the risk of errors or lost data.
- Seek out training and keep skills up-to-date. Allow teachers to invest time in working with the system to increase familiarity. This time will be repaid in what they can then achieve with it.
- If paper records are kept in classrooms, be aware of confidentiality issues.
- Be wary of tracking systems which reduce the curriculum to a series of points and which claim to help teachers to track termly and half-termly progress

Using assessment data to improve teaching and learning

Data is useful on different levels: for monitoring individuals, developing learning targets, grouping pupils, allocating resources, evaluating teaching initiatives, and for whole-school accountability and reporting.

Data from early or mid-year assessments is particularly useful for identifying areas for development or further consolidation, since there is

time following the assessments to respond to identified needs. A question-level analysis of the data at this stage can highlight areas of individual or class misunderstanding and so can help teachers to identify exactly what they need to clarify for their pupils.

Data from year-end assessments offers a valuable way to evaluate pupil progress over the duration of a learning period, measure success of interventions and teaching strategies implemented, and help schools plan for the following year.

"Effective use of data should stimulate questions about the standards achieved, the learning that is taking place and inform the next steps for teaching and learning"

It is worth bearing in mind that in summarising data numerically, some detail is inevitably lost. Therefore it is important to review your data and draw conclusions with care. Don't be afraid to ask critical questions. For example, if data for a particular pupil or class is not what you expected, think about contextual factors that may explain the differences.

Ultimately, assessment data should be used to deliver better learning outcomes for pupils. To do this effectively, schools may want to consider the following:

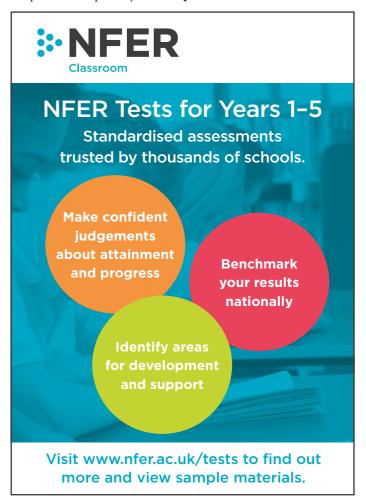
- Look not only at present attainment, but at pupils' rates of development as they move through the school and use this insight to shape classroom practice.
- Refer to assessment data regularly throughout the year, comparing achievement across subjects to guide evaluations of progress.
- Remind teachers that pupils' progress may not be linear: they appear not to progress at some times (e.g. while consolidating learning) and may progress more rapidly at others.
- Teachers can use question-level analysis (of national or published tests) to inform subject, class or year-group planning, but should draw conclusions carefully (e.g. avoid bold statements about attainment in a particular subject on the basis of just a few questions about part of that subject).
- Remember that, in a small school, class or year group, individual pupils can have a disproportionate impact on percentages.
- Aim for a culture of using data constructively for positive, supportive change.

As the academic year draws to a close, schools should remain mindful that data collection should not be viewed solely as a means of accountability. Effective use of data should stimulate questions about the standards achieved, the learning that is taking place and inform the next steps for teaching and learning.

• Emily Jones has been developing tests for more than 15 years, mainly for primary-age pupils. She now leads the development of the National Foundation for Educational Research's (NFER) own suite of standardised curriculum tests.

Further information

- For more information on NFER's work in assessment, visit www.nfer.ac.uk/key-topics-expertise/assessment/
- Assessment what are inspectors looking at? Sean Harford, Ofsted April 2018: http://bit.ly/2IMrE2Q



Further information and reading

www.nfer.ac.uk/research/pirls-2016/

Reading Achievement. Slough: NFER.

NFER

England. Oxford: OUCEA.

of teaching staff.

■ For further information on the PIRLS 2016 research and findings, visit

■ McGrane, Stiff, Baird, Lenkeit & Hopfenbeck (2017). Progress in

International Reading Literacy Study (PIRLS): National Report for

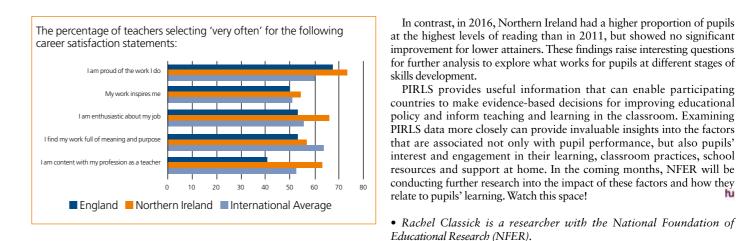
Sizmur, Ager, Classick, and Lynn (2017). PIRLS 2016 in Northern Ireland:

*Sampling procedures ensure the pupil samples are representative, but

findings from the headteacher/principal and teacher questionnaires may not

be representative of England and Northern Ireland's workforce as a whole. Findings should not be over-generalised to provide a single national picture





experienced teachers

England and Northern Ireland differed in terms of the experience of the teaching staff. The majority of pupils from England were taught by teachers with up to 10 years of experience, and had headteachers with up to 10 years of experience. For Northern Ireland, pupils were more likely to attend a school with a principal who had taught for at least 10 years, and be taught by a teacher with more than 10 years of experience; in fact 45 per cent were taught by teachers with experience of 20 years or more.

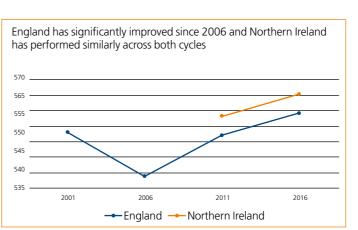
Principals in Northern Ireland were more likely to report being affected by resource shortages (e.g. supplies, teaching materials, teachers with specialist knowledge etc) than headteachers in England, but the proportion of pupils reportedly affected by this shortage was lower than was seen internationally.

England and Northern Ireland were both among the nations whose

PIRLS can track national performance over time

PIRLS has been conducted every five years since 2001. England has England's 2016 score was significantly different.

This reflects a rise in attainment for lower performing children in England, but their higher attainers have not improved to the same extent. Boys in England, generally lower attainers than girls, have improved the most between cycles and consequently the gender gap in reading appears



Pupils in Northern Ireland had more

headteachers/principals reported the highest emphasis on academic success. The scale for measuring emphasis on academic success included a range of factors, such as teachers' understanding of the school's curricular goals, teachers' ability to inspire pupils, parental commitment to ensure that pupils are ready to learn and pupils' ability to reach academic goals. Internationally, pupils in schools reporting a high emphasis on academic success scored significantly higher in PIRLS than those in schools reporting a lower emphasis on academic success.

participated since its inception and Northern Ireland participated for the first time in 2011. Although the graph below demonstrates that the 2016 PIRLS scores for England and Northern Ireland were higher than in 2011, only

to have decreased.

NFER Tests Trusted by thousands of schools Our assessments for Years 1-5 have been developed by assessment experts and standardised with over 60,000 pupils to provide reliable national comparisons. Benchmark your results **Gain formative** nationally using information to standardised guide teaching scores and learning Reliably monitor pupil attainment and Visit www.nfer.ac.uk/tests to find out more and view sample materials.

PIRLS: What can we learn?

Fifty countries took part in the most recent Progress in International Reading Literacy Study (PIRLS), the world-wide study of reading at ages 9 and 10. Rachel Classick looks at some key findings from England and Northern Ireland and what lessons we can learn

IRLS, directed by the International Association for the Evaluation of Education Achievement (IEA), assesses the reading skills of pupils and gathers extensive background information about pupils' learning environments at school and at home every five years.

In the latest survey carried out in 2016, with results published in December 2017, more than half a million pupils took part worldwide, including those from England and Northern Ireland, providing a rich source of information. Powerful insights emerge into how well education systems are functioning

internationally and how teaching and learning of reading can be improved.

Top performers

Research Insights

The good news is that Northern Ireland and England were among the top performers in PIRLS 2016.

The countries with the highest reading scores worldwide were the Russian Federation and Singapore. These were the only countries who significantly outperformed Northern Ireland and only seven countries scored significantly higher than England. Northern Ireland scored similarly to the Republic of Ireland, Finland and Poland, while England was on a par with Norway, Taiwan and Latvia.

What makes a good reader?

PIRLS enables us to investigate the characteristics of a "good reader", and it found that, internationally, "good readers" had an early start in literacy learning, with home learning environments that were supportive of literacy and had a positive attitude towards reading.

In terms of schooling, good readers attended well resourced, academically oriented schools that had a safe school environment. Pupils who attended school regularly and were not tired or hungry generally had higher reading attainment.

More girls than boys were good readers - girls significantly out-performed boys in all but two countries.

Phonics scores relate to PIRLS performance as it was found that pupils in England who reach the expected standard in the phonics check were among the highest scoring in PIRLS. As an increasing number of children in England are now reaching the expected standard in phonics, it will be

cycle of PIRLS in 2021. Factors such as eligibility for free school meals (FSM) and the number of books in the home (PIRLS' indicator of socioeconomic status) were also linked to how well a pupil performed in PIRLS 2016. Ethnicity and having English as an additional language did not act as predictors of PIRLS performance.

interesting to see whether this translates into higher scores in the next \

"Internationally, good readers had an early start in literacy learning, with home learning environments that were supportive of literacy and had a positive attitude towards reading. In terms of schooling, good readers attended well resourced, academically oriented schools that had a safe school environment"

Are teachers proud of the work that they do?

The survey also gathers information from the teachers and headteachers/ principals of the pupils taking part*. Teachers of PIRLS 2016 pupils were asked questions to determine levels of job satisfaction. More than two-thirds of the teachers in Northern Ireland were very satisfied with their job, with one-half of the teachers in England reporting the same.

The chart (above right) illustrates teachers' responses, and suggests they were frequently proud of the work that they do. Teachers in England generally reported being less content than those in Northern Ireland and internationally. Fewer teachers in England and Northern Ireland appeared to find their work full of meaning and purpose than was seen internationally.



Tackling teacher retention and turnover challenges

A major on-going research project by the National Foundation for Educational Research is helping us to gain a deeper understanding of the dynamics within retention and recruitment for the teacher workforce in England. Dorothy Lepkowska looks at the latest findings

eacher recruitment and retention remains one of the biggest issues facing policy-makers. But how to solve this is one of the great unanswered challenges in education.

Understanding how and why teachers are leaving is key in tackling retention. This is an important issue as pupil numbers are projected to increase by nearly 500,000 in the next five years. Fewer new trainees and teacher shortages in some key subjects further add to classroom pressures.

Recently published research from the National Foundation for Educational Research (NFER), funded by the Nuffield Foundation, has looked at the factors associated with teacher retention and turnover.

The Teacher Retention and Turnover Research: Interim Report (2017) found that between 2010 and 2015 the number of working-age teachers who left the profession each year has risen steadily from nine to 11 per cent for primary teachers, while the number leaving their school to work in another has risen from five to seven per cent. This has left some schools struggling to fill vacancies.

Flexible working in schools

One in four teachers in primary schools is currently employed part-time, compared with one in six in secondary schools. The prevalence of primary part-time working is partly due to more women working in the sector. However researchers said that much of the gap between primary and secondary persisted even when gender and age were accounted for.

"This suggests that primary schools are better able, or more willing, to accommodate part-time teachers," the report said. It added that part-time workers in secondary schools were more likely to leave the profession than primary teachers working on a similar basis, which suggests that primary schools are better at making part-time employment work.

The report calls for greater flexibility for teachers' working patterns in a bid to address recruitment and retention problems. Soon after the report was published, Justine Greening, the former education secretary, announced a pilot programme to encourage flexible working in schools to help schools "keep their valued teachers" and to enable them to stay in the profession while they raised families or approached retirement.

Ofsted ratings and MATs

The NFER report found that a school's Ofsted rating also influenced the movement of staff. Successive ratings of "inadequate" were likely to see a higher incidence of staff moving to another school or leaving the profession. Teachers working in schools which had been upgraded to "requires improvement" rating had a better chance of securing a new job than if their existing school had been downgraded "perhaps as the after-effect of previously being inadequate or because of the experience of delivering school improvement being viewed positively in the labour market", the research stated.

Multi-academy trusts (MATs) have a slightly higher than average rate of teachers leaving the profession compared to other school types, despite suggestions by another former education secretary, Nicky Morgan, that MAT models of staff development with opportunities for career progression would encourage more teachers to stay in their jobs.

The report said: "This may be due to different staff management practices in MATs but could also be due to the way that staff movements from a school to the MAT central team are recorded."

It went on: "After excluding internal moves within the same MAT, MATs had similar rates of teachers moving school when compared with other schools. There, therefore, appears to be little evidence to date to suggest that MATs are better able to retain their teachers."

The study recommended that MATs do more to promote career progression within their organisations and a feeling that the MAT was a structure to which teachers belong.

"The movement of teachers was found to be most acute in London, where considerably more staff were leaving compared with other parts of the country, including other large cities"

City living and job satisfaction

The movement of teachers was found to be most acute in London, where considerably more staff were leaving compared with other parts of the country, including other large cities. While the capital tended to attract staff aged in their 20s, it was losing one per cent of teachers in their 30s and 0.6 per cent of teachers in their 40s every year, at a time when pupil numbers were rising faster than in other parts of the country.

The report suggested that expensive housing was a deterrent to teachers wanting to work in London and recommended that policy-makers consider housing subsidies or other ways of reducing the costs of living in the capital.

Is the grass greener?

A subsequent study from the NFER in this Nuffield Foundation funded series, published in December, identified the aspirations and career paths of teachers who had left the profession. The research – *Is the Grass Greener Beyond Teaching?* (2017) – found that while those who had left teaching earned less pay in subsequent roles, they enjoyed increased job satisfaction and reduced working hours. Using data from the *Understanding Society* survey it recommended that teachers needed to be nurtured, valued and supported if they were to remain in the profession.

The study found that more than half of leaving teachers who were not retiring, remained working in education in some capacity, usually moving to the private sector or taking on a non-teaching role. Typically, these teachers earned up to 10 per cent less in a new role but gained other benefits, such as a reduction in working hours and increased job satisfaction.

The self-reported job satisfaction of teachers who left the profession declined in the years before they left. The authors recommended that school leaders, the government and school inspectors needed to jointly review the impact their actions were having on teachers' workload and how this could be mitigated.

Jack Worth, a senior economist at NFER, said: "This data gives us rich and valuable insights on what motivates teachers to leave teaching, because we can see how their lives change after leaving and taking up a new job. Policy responses that aim to increase teacher retention need to consider pay alongside other factors, such as teachers' workload, working hours and job satisfaction."

• Dorothy Lepkowska is a freelance education journalist.

Teacher Retention and Turnover Research

■ NFER will be publishing further insights this year including a final report in the summer. To find out more about the on-going Teacher Retention and Turnover project and to receive the latest research directly to your in-box, visit www.nfer.ac.uk/research/teaching-workforce-dynamics/

Further information and reading

In recent years, NFER has published several research reports on the school workforce, examining the extent of the teacher recruitment and retention problems:

- Teacher Retention and Turnover Research: Research update 3: Is the Grass Greener Beyond Teaching? 2017: www.nfer.ac.uk/publications/ NUFS04/
- Teacher Retention and Turnover Research: Interim Report, 2017: www. nfer.ac.uk/publications/NUFS03/
- Teacher Retention and Turnover Research: Research update 2: Teacher dynamics in multi-academy trusts, 2017: www.nfer.ac.uk/publications/ NUFS02/
- Teacher Retention and Turnover Research: Research update 1: Teacher retention by subject, 2017: www.nfer.ac.uk/publications/NUFS01/
- Keeping Your Head: NFER Analysis of Headteacher Retention, 2017: www.nfer.ac.uk/publications/LFSC01/
- Engaging Teachers: NFER analysis of teacher retention, 2016: www.nfer.ac.uk/publications/LFSB01/
- Should I Stay or Should I Go? NFER Analysis of Teachers Joining and Leaving the Profession, 2015: www.nfer.ac.uk/publications/LFSA01/



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Evidence-based resources: Do they make a difference?

Many teachers find it hard to engage with and act on research evidence, even when they know it can help them to improve teaching practice and student outcomes. Dorothy Lepkowska explains

wo new studies undertaken by the National Foundation for Educational Research (NFER) and known as The Literacy Octopus Trials, named after their multi-armed design, have looked at the impact of research dissemination on achievement in schools. The studies were funded by the Education Endowment Foundation (EEF), the Department for Education (DfE) and the Mayor of London's Schools Excellence Fund as part of a bigger scheme of exploring the use of research in schools.

As some of the largest education trials to date, a total of more than 13,000 primary schools in England were involved in the studies which looked at a range of evidence-based resources and events designed to support the teaching and learning of literacy at key stage 2. These

included printed and online research summaries, evidence-based practice guides, webinars, face-to-face professional development events and access to online tools.

The first study, which involved 12,500 primary schools, looked at different approaches to the dissemination and communication of research materials to support literacy teaching at key stage 2, using a randomised controlled trial (RCT). The materials for this Literacy Dissemination Trial were drawn up by four leading organisations with experience of engaging schools in the use of evidence. The schools were split into five groups of 2,500 schools each. One was a control group which did not receive any of the materials. The remaining groups were sent resources from one of the four organisations each using a different dissemination method:

"Teachers and school leaders now have access to a significant and growing body of academic research with enormous potential to improve pupil attainment and save schools money. But to do this, we need to make sure that research findings get into the hands of teachers in ways that are most likely to have an impact"

- Improved Reading: A Guide for Teachers (published by the Centre for Evaluation and Monitoring, Durham University).
- Better Evidence-based Education (a magazine from the Institute for Effective Education, University of York).
- A link to an archived webinar and materials from a conference on research evidence relating to key stage 2 literacy (from ResearchED in collaboration with NatCen).
- A subscription to the Teaching How2s website, which focuses on evidence-based techniques and visual guides for teachers (delivered by the Campaign for Learning with Train Visual).

The resources were simply sent to the schools with a note about the trial. The purpose of this large-scale trial was to assess the impact of disseminating evidence-based resources on pupil outcomes, rather than to explore if or how the materials were used.

A second RCT involved 823 schools, and tested whether combining resources with light-touch support on their use would have greater impact. Some of the schools received light-touch support, including invitations to seminars on using the materials in the classroom, webinars before and after conferences to provide support on how to use the materials, and introductory events to using online resources.

Neither trial found evidence of improved literacy attainment at key stage 2 and the second study, which included a survey, showed no difference in teachers' use of research, despite the additional support. The results suggest that, in general, light-touch interventions and resources need more support to make a difference.

The initial engagement of schools with the disseminated materials varied. Even where the materials included guidance on how to apply evidence in practice, the report suggested that trying to get teachers to engage with the resources or support was a challenge.

Six out of 10 primary schools engaged only a little or not at all according to monitoring data, citing a lack of time and a preference for more interactive support.

However, around one in six schools engaged and used the materials to a greater degree than expected, for example by hosting CPD sessions and requesting further materials. Through case studies, the study found a small number of schools that went further and implemented change after using the resources, or trialled new ideas and embedded them in their classroom practice.

Researchers plan to publish pupil outcomes in a year's time from the 2016/17 cohort to establish whether there was any long-term effect from interventions.

The report concluded that the findings had raised two key issues. The first was centred on what could be done to encourage schools to engage more in research evidence, when they are already over-burdened with information. Second, it said it was important to consider what level of additional activity around research would help schools to use and refer to research in order to improve pupil outcomes.

To examine these questions further, the EEF has launched two campaigns to promote the effective use of evidence, focusing on primaryage literacy in the North East of England and better use of teaching assistants in the classroom in 1,000 schools in Yorkshire and Lincolnshire.

Dr Ben Styles, head of NFER's Education Trials Unit, explained: "Although the findings of this research are of critical importance to organisations involved in the translation of research evidence into

practice, there are also aspects of these trials that should warm the hearts of those doing rigorous evaluation research.

"The fact that more than 800 primary schools were willing to sign up to a trial that required various levels of proactive engagement by teachers, in combination with the ability to analyse data from the National Pupil Database has resulted in a rare example of robust quantitative evaluation in this field."

Commenting on the reports, Sir Kevan Collins, chief executive of the EEF, said: "Teachers and school leaders now have access to a significant and growing body of academic research with enormous potential to improve pupil attainment and save schools money. But to do this, we need to make sure that research findings get into the hands of teachers in ways that are most likely to have an impact.

"We know how challenging this can be. Light-touch interventions are unlikely to have an impact on pupil attainment and getting teachers to engage with research is far from straightforward. We need to focus our efforts on more targeted and structured approaches to disseminate evidence and support teachers."

• Dorothy Lepkowska is a freelance education journalist.

Further information

- Literacy Octopus Dissemination Trial the evaluation report and executive summary report can be found at www.nfer.ac.uk/publications/EEFA02/
- Evidence-based Literacy Support the Literacy Octopus Trial: The evaluation report and executive summary can be found at www.nfer.ac.uk/publications/EEFA01/
- More information on this project can also be found via the EEF. Visit: https://educationendowmentfoundation.org.uk/ projects-and-evaluation/projects/the-literacy-octopuscommunicating-and-engaging-with-research/



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How after-school coding clubs can benefit pupils

In an increasingly digital world, Suzanne Straw looks at research findings showing to what extent afterschool coding clubs can support young people to develop skills and further their interest in coding

fter-school clubs have become an integral part of learning in the past couple of decades. Successive governments have had an expectation that schools will provide extended provision, and part of their role is to enhance learning in the classroom and to build and develop other personal and study skills.

Code Club UK supports a nationwide network of volunteer and teacher-led after-school programming clubs. It was founded in 2012 and, in 2015, joined forces with the Raspberry Pi Foundation.

Code Clubs are run in schools and libraries, for children aged nine to 13 years. They run for around an hour a week during term-time and have about 15 participants who learn to programme by making games, animations, applications and websites. Code Club UK's projects and materials support the teaching of Scratch, HTML/CSS and Python. The aim of Code Club is to develop children's programming skills and to inspire them to consider programming and other digital careers in the future.

Five years ago there were only a handful of Code Clubs in the UK. Now, there are nearly 6,000, attended by more than 82,000 children. There are also more than 10,000 Code Clubs running around the world.

Between June 2015 and March 2017, Code Club UK worked with the National Foundation for Educational Research (NFER) to undertake an evaluation of Code Clubs. The evaluation took the form of a randomised control trial (RCT), with an associated process evaluation. It explored the impact that Code Clubs make on children's computational thinking and programming skills, as well as their attitudes towards computers and coding. In some cases, Code Clubs were set up purely to participate

in the trial. NFER's report, Randomised Controlled Trial and Process Evaluation of Code Clubs, was published recently.

The trial involved 21 schools. Pupils who expressed an interest in taking part in the clubs completed a series of baseline and end-point assessments. The Bebras Computational Thinking Assessment was chosen as the primary outcome measure, with secondary measures including a coding quiz and pupil attitude survey.

Following the baseline assessments, pupils were randomly assigned to intervention and control groups. Pupils in the intervention group attended Code Club for a year and schools were asked to cover Scratch, HTML/CSS and Python. Control group children were assured of a place in Code Club the following year.

The findings from the analysis of pupils' baseline and end-point scores on the Bebras measure showed that attending Club Code for a year did not have an impact on children's computational thinking over and above positive changes that occurred anyway. Researchers concluded that this was probably because computational thinking was being developed as part of the normal computing curriculum and that Code Clubs were consolidating learning and skills rather than further developing them. Researchers also suggested that a year of participation might not be a long enough period to see significant changes in computational thinking.

However, the analysis showed that attending Code Club did significantly improve pupils' coding skills in Scratch, HTML/CSS and Python, and this happened even when a control group of pupils were learning Scratch as part of the computing curriculum in school.

Intervention pupils were using all of the programming languages more. This was particularly the case with Scratch, for which the proportion of intervention children who reported using Scratch every week rose by 27 percentage points between the baseline and end-point.

The study also found that pupils attending Club Code were using computers more and, in addition, a higher proportion at end-point reported that they were good or very good at making things with code compared to control group pupils and the baseline.

Pupils' interest in learning about coding, and learning about coding languages in the future, was high for both groups at both baseline and end-point, with two-thirds or more of pupils in both groups reporting that they were interested or very interested in these areas at end-point.

In addition, just under half of pupils in both groups reported that they were interested in a job that involved coding at end-point. However, Code Club was not shown to have an impact on pupils' already high levels of interest in these three areas.

Teachers reported that early impact on pupils' understanding of concepts and development of confidence in coding could be seen at the end of the first term of Code Club delivery. However, two or three terms were needed to see progress in terms of pupils working independently and displaying the resilience to work out problems for themselves.

Echoing pupils' own reports, teachers reported a range of positive outcomes for pupils, including the development of confidence and skills in coding, IT and using computers. In some cases, teachers were drawing on the skills of Code Club pupils to support other pupils in the classroom who were struggling with coding.

Teachers reported that pupils were developing important skills for the future: "It's a great thing to be exposing children to and in the future they will be glad that they did it. All the world is based on IT now and they need to do it, and it's very positive for their future."

In addition, teachers emphasised that Code Club gives some pupils the opportunity to succeed in coding when they are not doing so well in other school subjects: "It's a fantastic resource and it enables pupils to succeed when they haven't elsewhere. It's a very good skill for pupils to develop."

"Teachers reported a range of positive outcomes for pupils, including the development of confidence and skills in coding, IT and using computers. In some cases, teachers were drawing on the skills of Code Club pupils to support other pupils in the classroom who were struggling with coding"

Most club leaders reported that there were not any differences in engagement and impact for boys and girls. Others reported greater impact for boys, or girls. Some club leaders reported that boys were more enthused, committed and resilient and achieved more than girls. Other teachers reported that girls might lack confidence initially but that they performed better than their male peers over time.

One respondent said: "A couple of the girls lacked confidence at the beginning of the sessions but their confidence and self-belief increased greatly as the weeks went by – they 'dug deep' and solved many of their own errors. In contrast, a couple of the boys were over-confident but when the going got tough with the HTML projects they gave up easily and constantly asked for help, wanting their issues solved straight away rather than just be pointed in the right direction."

Club leaders also pointed out that they had benefited themselves from running the clubs. Benefits included increased confidence in coding and greater familiarity, expertise and skills in all of the programming languages, which they could disseminate to other staff.

Most clubs ran smoothly during the academic year and club leaders reported that access to Code Club UK's projects and teacher notes had been key to the successful running of their club. As this club leader commented: "Great resources: pupils really engaged with the material. They loved adapting and creating their own games."

Where difficulties were experienced, they related to insufficient time, technical problems, a lack of knowledge of the languages and pupil drop-out. Half of the Code Clubs did not cover all of the programming languages during the year, with a number focusing on Scratch which pupils found more enjoying and accessible.

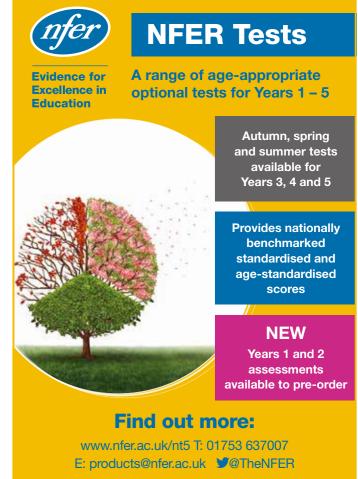
Philip Colligan, chief executive of the Raspberry Pi Foundation, said: "The trial has given us lots to work on. What do we mean by computational thinking and how do we best support volunteers and teachers to teach those concepts in an engaging way? How do we get better at managing the transition from visual to text-based programming languages? How can we most effectively identify and spread practice between Code Clubs? These are questions that are important not just for Code Club but for the whole field of computer science education."

He added: "With the evidence of positive impact and the insights generated by this research, we are in a much stronger position to build the skills and confidence that young people need to thrive in an increasingly digital world."

• Suzanne Straw is deputy head of Centre for Evaluation and Consultancy at the National Foundation for Educational Research.

Further information

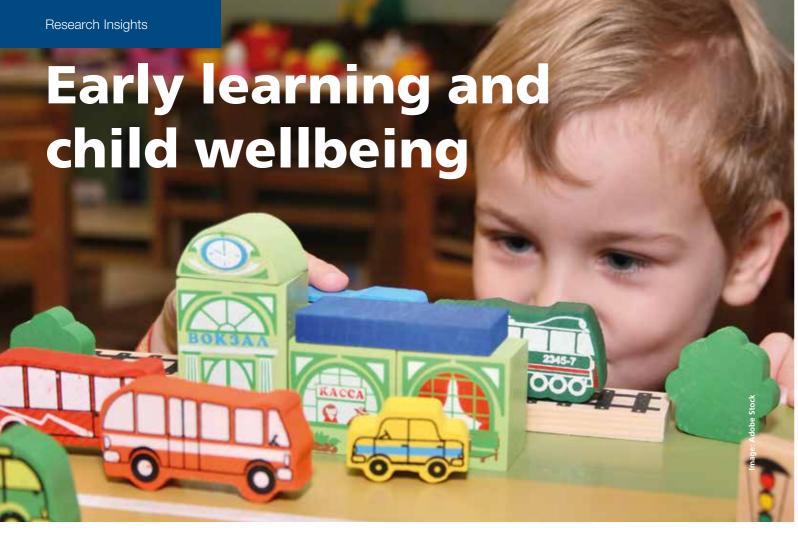
- Randomised Controlled Trial and Process Evaluation of Code Clubs, NFER, May 2017: www.nfer.ac.uk/publications/CODE01
- Code Club UK: www.codeclub.org.uk
- Raspberry Pi Foundation: www.raspberrypi.org



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The National Foundation for Educational Research (NFER) is piloting the OECD's new study of early learning and wellbeing in England later this autumn term. Caroline Sharp explains what the study is about and what it will mean for schools

In July, the Department for Education (DfE) announced England's participation in an Organisation for Economic Co-operation and Development (OECD) study designed to investigate children's early learning and wellbeing. The International Early Learning and Child Wellbeing Study (IELS) will focus on the development of five-year-olds in different countries. The NFER is leading the delivery of this work in England on behalf of the DfE and the OECD.

The period from birth to age five is a crucial stage in children's development. During this period, children experience a rapid increase in their cognitive, linguistic, social and emotional and motor skills. After the age of five, the amount of effort it takes to learn new skills increases. So, it is not surprising that what happens in the early years has a profound effect on children's development and later life chances.

We already know a great deal about the influences on children's early learning, thanks to a growing body of research in this area. This includes high-quality studies in England such as Effective Provision of Pre-school Education (EPPE), the Study of Early Education and Development (SEED) and the Millennium Cohort Study.

The IELS study will add to this knowledge base, as Professor Iram Siraj-Blatchford (one of the main authors of the EPPE study) has said: "This study will give us valuable insight into how five-year-olds develop, which will be of huge benefit not just to professionals, but also to parents who want to know how best to support their children's early home learning."

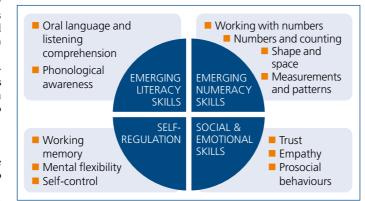
Five benefits of this study

- It will tell us more about the range of things children can do at age five and how their cognitive development, language and numeracy relate to social skills and other aspects of wellbeing.
- It will identify the types of experiences that help young children to thrive, whether in an early years setting, at school or at home.
- It will shed light on the relationship between disadvantage and early learning, as well as the influence of other characteristics of children and their families.

- It will provide insights for parents/carers and practitioners into how to support children's development in the early years.
- It will inform and improve national policies in the early years, by providing powerful evidence to help target investment in early education to strengthen children's access to positive learning experiences right from the beginning of their lives.

Domains of early learning

The new study takes a holistic approach to exploring how to support a child's cognitive, social and emotional wellbeing through a combination of interactive stories and games for five-year-olds. It will investigate a range of outcomes, including children's social and emotional wellbeing and selfregulation, as well as their emerging language and numeracy skills.



Research focus: The four early learning domains to be assessed in the International Early Learning and Child Wellbeing Study as described in the OECD's Early Learning Matters project brochure: http://bit.ly/2wUalqd

Some of the information will be collected from parents and teachers, and some in one-to-one sessions with children. Parents will be asked to complete a questionnaire about their child's characteristics, behaviour and the home learning environment.

Teachers will be asked to complete a questionnaire about their own professional background and to provide their assessment of each child's development, based on their observations.

Children will be invited to take part in fun tablet-based games and stories, which do not require them to read or write. Study administrators will be fully trained in working with this age group in order to help children to use the tablets and two animated characters (Tom and Mia) will help guide children through the activities.

I realise that the idea of assessing young children may raise some concern but I was reassured when I saw the activities, which are designed to be enjoyable and engaging to five-year-olds.

If children do not want to take part, the study administrators will ensure that they are not pressured to do so, or to continue if they want to stop. However, the feedback from early trials has shown that children enjoy the activities and are even disappointed when their session comes

Andreas Schleicher, director for education and skills at the OECD, said: "If anything, this study is designed to counter the increasing schoolification that we see in early childhood education."

What will it tell us that we don't already know?

The results of this study will enable us to identify whether children's cognitive and emotional skills appear to be related, or are distinct from each other. It will also establish the relationship between children's abilities at age five - taking account of their month of birth - and their previous experiences at home, at school, and in early years settings.

England has a distinctive early years education and care system, featuring a wide range of providers and an early start in school. This study will compare the outcomes of children in England with children in other countries who have had very different learning experiences up to the age of five. The study will build the evidence-base for future decision-making about support and provision.

The findings will be shared with professionals and parents/carers to inform their interactions. Participating schools will be invited to attend a conference to hear about the findings and discuss the implications for

What will the study mean for the schools?

The schools that take part will be contributing to the development of this new study and adding to the evidence on what supports children's early learning and development.

Each school in the sample will represent other schools which have similar characteristics, for instance other schools in England with a similar proportion of pupils eligible for free school meals. It is very important that all selected schools participate and we will do everything we can to support schools, teachers and parents to take part. We really appreciate headteachers' support for the study and we are working hard to make participation as straight-forward as possible. We will also compensate schools for the staff time involved.

Once a school agrees, the NFER will select a random sample of 15 five-year-olds. Our study administrators will visit each school to complete the one-to-one activities with children. Each of the four activities will take 15 to 20 minutes, and each child will take part over a period of two days. The children's teachers and parents will be invited to complete a questionnaire providing information about themselves and the children.

Study timeline

- September 2017: The 30 schools selected to participate in the IELS field trial have been contacted by NFER.
- October December 2017: Children, parents/carers and schools take part in the field trial. The questions and activities which work best are taken forward to the main study.
- October November 2018: Children, parents/carers and schools take part in the main study. This will involve at least 3,000 children and parents/carers in 200 schools.

"The period from birth to age five is a crucial stage in children's development. **During this period, children experience a** rapid increase in their cognitive, linguistic, social and emotional and motor skills. After the age of five, the amount of effort it takes to learn new skills increases"

- Spring 2019 spring 2020: The international research team analyses the responses from participating countries.
- Spring 2020: National and international reports will be published. w
- Caroline Sharp is an experienced research director with a strong track record in early childhood education, including studies on: the influence of season of birth on educational outcomes; transition to key stage 1; children's centre leadership; and targeting children's centre services to help the most needy families. Her recent work has also focused on school improvement and workforce issues. NFER has extensive experience in carrying out international comparison surveys such as PISA, TIMSS,

Further information

For further information about this study, visit www.nfer.ac.uk/iels or www.oecd.org/edu/school/international-early-learning-and-childwell-being-study.htm



