

Early Years Toolkit

May 2015

About the Early Years Toolkit

The Early Years Toolkit is an accessible summary of educational research that provides guidance for early years professionals on how to use their resources to improve the learning of disadvantaged children. The Toolkit currently covers 12 topics, each summarised in terms of their average impact on learning, the strength of the evidence supporting them and their cost.

The Toolkit is a live resource that will be extended and updated on a regular basis as new summaries are completed and as findings from EEF-funded projects and other high-quality research become available. We would welcome suggestions for topics to be included in future updates. If you have a topic suggestion, or any other comments or questions about the Early Years Toolkit, please contact Robbie Coleman at robbie.coleman@eefoundation.org.uk.

Average impact

Average impact is estimated in terms of the additional months' progress you might expect children to make as a result of an approach being used in an early years setting, taking average progress over a year as a benchmark.

For example, research summarised in the Toolkit shows that parental engagement approaches that have been evaluated in the past have had an average impact of five months. This means that children in early years settings where a new parental engagement strategy was introduced made, on average, five months more progress over the course of a year compared to similar children in a setting that did not introduce the strategy.

These estimations are based on 'effect sizes' reported in British and international comparative data (see table below). Effect sizes are quantitative measures of the impact of different approaches on learning. The Toolkit prioritises **systematic reviews** of research and quantitative syntheses of data such as **meta-analyses** of experimental studies. In most cases the effect sizes included in the Early Years Toolkit are based on early literacy, early numeracy or early communication outcomes, which are the strongest predictors of future academic outcomes in schools.

Most approaches included in the Toolkit tend to have similar average impacts on children with different characteristics. However, where the research summarised suggests that an approach has a different average impact on the learning of children from disadvantaged backgrounds compared to the learning of their peers, the Toolkit's 'headline' average impact figure refers to the former.

Months' progress	Effective size from...	...to	Description
0	-0.01	0.01	Very low or no effect
1	0.02	0.09	Low
2	0.10	0.18	Low
3	0.19	0.26	Moderate
4	0.27	0.35	Moderate
5	0.36	0.44	Moderate
6	0.45	0.52	High
7	0.53	0.61	High
8	0.62	0.69	High
9	0.70	0.78	Very high
10	0.79	0.87	Very high
11	0.88	0.95	Very high
12	0.96	>1.0	Very high

Cost

Cost estimates are based on the approximate cost of implementing an approach in a group of 26 children. Estimates commonly include the cost of additional resources, and training or professional development if required.

Cost	Description
£	Very low: up to about £2,000 per year for 26 children, or less than £80 per child per year.
£ £	Low: £2,001 to £5,000 per year for 26 children, or up to about £170 per child per year.
£ £ £	Moderate: £5,001 to £18,000 per year for 26 children, or up to about £700 per child per year.
£ £ £ £	High: £18,001 to £30,000 per year for 26 children, or up to £1,200 per child per year.
£ £ £ £ £	Very high: over £30,000 per year for 26 children, or over £1,200 per child per year.

Evidence

Evidence estimates are based on the availability of evidence, the methodological quality of the primary evidence, and the reliability or consistency of this impact across the studies reviewed.

Rating	Description
    	Very limited: Quantitative evidence of impact from single studies, but with effect size data reported or calculable. No systematic reviews with quantitative data or meta-analyses located.
    	Limited: At least one meta-analysis or systematic review with quantitative evidence of impact on educational or cognitive outcome measures.
    	Moderate: Two or more rigorous meta-analyses of experimental studies with educational or cognitive outcome measures.
    	Extensive: Three or more meta-analyses from well-controlled experiments mainly undertaken using data with educational or cognitive outcome measures with some exploration of causes of any identified heterogeneity.
    	Very extensive: Consistent high quality evidence from at least five robust and recent meta-analyses where the majority of the included studies have good ecological validity and with educational or cognitive outcome measures.

Who wrote the Toolkit?

The Early Years Toolkit has been produced by the Education Endowment Foundation in collaboration with a team of academics at Durham University, led by Professor Steve Higgins.

The Early Years Toolkit follows a similar methodology to the Sutton Trust-EEF Teaching and Learning Toolkit, which provides guidance for teachers and schools on how to use their resources to improve the attainment of disadvantaged pupils.

Using the Early Years Toolkit

Like any toolkit, the Early Years Toolkit will be most useful when in the hands of professionals. The aim of the Toolkit is to support early years professionals and providers to make informed choices and adopt a more evidence-informed approach. The evidence it contains is intended as a supplement to, rather than a substitute for, professional judgement; it provides no guaranteed solutions or quick fixes.

To get the most of the Toolkit, we recommend that you:

1. Dig deeper into the research

The headline measures in the Toolkit can hide a wide range of potential impacts and implementation implications. If you are considering adopting a new approach, dig deeper into the summaries, and follow some of the related links to other research and resources. Use the Toolkit as a starting point for a discussion with colleagues, rather than as a checklist.

2. Don't forget the importance of context and implementation

The summaries in the Toolkit combine evidence from a broad range of research studies into a single average for each area. This average will not necessarily be the impact of this approach in your setting. Some of the approaches that are less effective on average might work well with particular children, or if developed in a new way. Similarly, an approach that tends to be more effective on average may not work so well in a new context.

In almost all cases, a new approach is unlikely to improve educational outcomes if implementation is poor, for example if staff are not provided with sufficient training to deliver it or do not understand why a change is being made. Meet with your colleagues and consider some of the questions at the end of each Toolkit summary before implementing a new approach.

3. Evaluate

As a result of the importance of context and implementation, it is crucial to use the Toolkit alongside on-going evaluations of the impact of the decisions you make. Evaluation can help you feel confident that a new approach is really worth the effort, or identify whether it's actually having a lasting impact on learning.

Communication and language approaches

**+6**
months

What is it?

Communication and language approaches emphasise the importance of spoken language and verbal interaction. They are based on the idea that children's language development benefits from approaches that explicitly support talking, verbal expression, modelling language and reasoning. Communication and language approaches used in the early years include reading aloud and discussing books with young children, explicitly extending children's spoken vocabulary by introducing them to new words in context, and drawing attention to letters and sounds. Approaches usually involve an early years professional, nursery teacher or teaching assistant, who has been trained in the approach, working with a small group of children or individually to develop spoken language skills.

How effective is it?

Overall, studies of communication and language approaches consistently show positive benefits for young children's learning, including their spoken language skills, their expressive vocabulary and their early reading skills. On average, children who are involved in communication and language approaches make approximately six months' additional progress over the course of a year. All children appear to benefit from such approaches, but some studies show slightly larger effects for children from disadvantaged backgrounds (up to six months' additional progress).

Some types of communication and language approaches appear, on average, to be more effective than others. There is consistent evidence that reading to young children, and encouraging them to answer questions and talk about the story with a trained adult, is an effective approach. A number of studies show the benefits of programmes where trained teaching assistants have supported both oral language and early reading skills. Most studies comment on the importance of training and teacher development, and supporting teachers with the implementation of different approaches. There are indications that practitioners should take a range of different approaches to developing communication and language skills, as it is unlikely that one approach alone is enough to secure progress.

How secure is the evidence?

There is a secure evidence base showing the impact of communication and language approaches, including a number of **meta-analyses**. The evidence is relatively consistent, suggesting that communication and language approaches can be successful in a variety of environments. The evidence base includes a number of high quality studies from the UK. Little is known about the long-term impact of communication and language approaches, so additional evidence about whether and how to ensure that benefits are maintained once children start school would be valuable.

What are the costs?

Overall, the costs are estimated as very low. There are few, if any, direct financial costs associated with this approach. Additional resources such as books for discussion may be required. In a recent UK evaluation the cost of these additional resources was estimated at between £10 and £20 per pupil. Professional development or training is also likely to enhance the benefits on learning.

What should I consider?

How can you help children to articulate and express their ideas and experiences verbally?

What training will adults involved received to ensure they are able to model and develop children's spoken language skills?

How can you link children's spoken language with their developing writing and reading skills?

Combining a range of communication and language approaches is likely to be more effective than a single approach. How will you ensure that children are exposed to a range of different communication and language strategies?

Digital technology

£ £ £ £ £

**+4**
months

What is it?

The use of digital technologies to support children's development and learning. This includes approaches where:

children use technology independently, either as part of their planned experiences or as part of teaching activities such as instructional games; technology, such as interactive whiteboards or digital cameras, is used by early years professionals to support their interactions with children; and technology is used to support professional development.

How effective is it?

Overall, studies investigating the use of digital technology find that it is associated with moderate learning gains, on average an additional four months' progress over the course of a year. Evidence suggests that technology should be used to supplement, rather than replace, other teaching activities and interactions. Introducing new technology on its own is unlikely to have an impact; it must be accompanied by a change in pedagogy to improve learning.

A number of structured programmes and instructional games for four to five year old children that aim to supplement the teaching of early literacy or mathematics skills have been evaluated and have shown positive impacts on learning. There is also evidence from the USA that the use of technology can support the professional development of early years teachers in mathematics. A study from the USA showed that providing video examples of effective practice for early years professionals to apply and develop can directly benefit children's learning.

The degree to which digital technology should be used in early years education is highly contested. Some studies suggest that excessive use of digital technology (e.g. more than 1-2 hours a day, including television) is linked to attention problems, sleep and eating disorders and obesity. However, no high quality evaluations have assessed the link between extended use of technology and educational outcomes in the early years.

Digital technology is a developing field and this can mean that evidence lags behind new developments. For example, no high quality evaluations appear to have assessed the impact of tablets on educational outcomes in the early years.

How secure is the evidence?

Overall, the evidence related to digital technology is limited. The evidence for the benefits of digital technology on young children is based mainly on single studies rather than **meta-analyses**, and is weaker than the evidence focusing on older age groups. The key messages from the evidence are broadly consistent with evidence about use of technology in schools. It is also important to remember that the pace of technological change means that evidence is usually about yesterday's technology rather than today's, suggesting that evaluating new approaches is important. The average impact of digital technology programmes has remained relatively consistent for some time, implying that general messages are likely to remain relevant.

What are the costs?

The initial costs of investing in new technologies are high. Once technology has been purchased, it can usually be used for several years, and many early years settings are already equipped with computers, digital cameras and interactive whiteboards. The evidence suggests that early years settings rarely take into account, or budget for, the additional training and support costs that are likely to make the difference to how well the technology is used. Expenditure is estimated at an average of £300 per child for equipment and technical support and a further £500 per nursery class (£35 per child) for professional development. Costs are therefore estimated as moderate.

What should I consider?

Introducing new technology does not automatically lead to improved educational outcomes. How will you use the technology to support learning?

Early years professionals need support and time to learn to use new technology effectively. This involves more than just learning how to use the technology; it should include support to understand how it can be used to improve learning.

It is important to evaluate the impact of using new technology. Have you considered how you will evaluate the impact of any new approaches?

Earlier starting age

£ £ £ £ £



+6
months

What is it?

Increasing the time a child spends in early years education by beginning at a younger age. This would typically mean being enrolled in nursery or pre-school from the age of two or three and experiencing up to two years of early years education before starting school.

For an assessment of the evidence related to increasing the number of hours spent in early years education at a given time, see “[Extra hours](#)”.

How effective is it?

Beginning early years education at a younger age appears to have a moderate positive impact on learning outcomes. It is estimated that children who start to attend an early years setting before turning three make approximately six additional months' progress compared to those who start a year later. Moderate positive effects have been detected for early reading outcomes in the first year of primary school and moderate to high effects have been detected for early language and number skills. There are some indications that the impact of high-quality early years provision is particularly positive for children from low-income families.

Evidence about the medium- and long-term impact of an earlier starting age is mixed. In some studies some improvements are detectable into primary school. However, in several US studies benefits do not appear to sustain. It appears likely that the quality of provision is the key determinant of sustained improvement, but more evidence is needed in this area. The existing evidence base relates primarily to attendance at early years centres or nurseries, rather than provision from childminders.

How secure is the evidence?

Overall, the evidence base related to earlier starting ages is limited.

In the UK, the highest quality study conducted to date which has assessed the impact on an earlier starting age is the Effective Provision of Pre-school Education (EPPE) project. The study looked at the association between different kinds of pre-school provision and young children's learning, and involved 3,000 children. However, its correlational design means that it cannot rule out some alternative explanations for its finding that earlier starting ages boost learning outcomes.

The school starting age is different in different countries, which can also make it hard to assess the applicability of evidence from overseas. For example, though findings related to earlier starting ages from the USA are consistent with those from the UK, pre-kindergarten education in the USA typically involves four and five year olds, and few high-quality studies assess the impact of starting at two or three.

Given the high cost of beginning early years education at an earlier age, it would be important to evaluate the impact of any activity in this area.

What are the costs?

Overall, the costs are estimated as very high. A full time pre-school place costs about £8,000 for 40 weeks at about £200 per week.

What should I consider?

If you are planning to encourage families to enrol their children in early years education earlier, how will you ensure that the quality of early years provision remains high?

How will you evaluate the impact of an earlier starting age?

Have your staff been given appropriate training to support younger children?

Early literacy approaches

**+4**
months

What is it?

Early literacy approaches aim to improve young children's skills, knowledge or understanding related to reading or writing. Common approaches include: storytelling and group reading, activities that aim to develop letter knowledge, knowledge of sounds and early phonics, or introductions to different kinds of writing. Early literacy strategies may have components in common with Communication and language approaches and may also involve **Parental engagement**.

How effective is it?

Early literacy approaches have been consistently found to have a positive effect on early learning outcomes. Early literacy approaches evaluated to date led to an average impact of four additional months' progress, with the most effective approaches improving learning by as much as six months.

All children appear to benefit from early literacy approaches, but there is some evidence that certain strategies, particularly those involving targeted small group interaction, may have particularly positive effects on children from disadvantaged backgrounds. However, early literacy approaches should not be seen as a panacea. Though long-term positive effects have been detected in some studies, for a majority of strategies these benefits appear to fade over time, suggesting that a single intervention is unlikely to be enough to close the gap.

There is evidence that a combination of early literacy approaches is likely to be more effective than any single approach. For example, some studies suggest that it is possible to develop certain aspects of literacy, such as knowledge of the alphabet or letter names and sounds, without improving all aspects of early literacy. It is likely to be beneficial to put a range of activities in place, and to use these in combination with regular assessments of early literacy skills, knowledge and understanding.

Studies indicate that involving parents in developing early literacy strategies can be beneficial, and ensuring that training and professional development is provided for staff when new approaches are introduced is likely to increase impact.

How secure is the evidence?

There is extensive evidence related to the impact of early literacy approaches, including a number of **meta-analyses** and high quality individual studies. One challenge with the evidence base is that early literacy approaches are often only one part of multi-component interventions or curricula, which can make it hard to attribute changes to the early literacy approach, or to identify which aspects of that approach are most important. In addition, in common with a number of areas of early years education, the most robust evidence collected to date has been collected in the USA. Testing some of the most promising early literacy approaches from overseas in the UK would be valuable.

What are the costs?

Overall, the costs of early literacy approaches are estimated as very low. Research indicates that knowledge of children's development and current understanding are an important precursor to putting an early literacy strategy in place, and using professional development to support the introduction of new early literacy interventions is associated with increased learning. As a result, some assessment and professional development costs are included in this estimate. Other resources such as books and other print materials are also likely to be necessary.

What should I consider?

How will you ensure that your early literacy strategy is well-balanced, and combines approaches that will support the development of skills, knowledge and understanding?

Do you use assessments to identify children's current level of development, and monitor learning?

When you introduce new early literacy approaches, do staff receive sufficient training and professional development?

How do you use targeted small group support to help areas of challenge for disadvantaged children?

Early numeracy approaches

**+5**
months

What is it?

Early numeracy approaches aim to develop number skills and improve young children's knowledge and understanding of early mathematical concepts. Activities in this area might be structured, for example through programmes designed to develop children's 'number sense' (their developing understanding of quantity and number), or more informal, for example, using mathematical games or computer games (see also [Digital technology](#)), or pretend activities involving counting.

How effective is it?

On average, early numeracy approaches have been found to have a positive impact on learning equivalent to approximately five additional months' progress in early mathematics outcomes. There is some variation between approaches, which suggests that the way in which strategies are introduced may have a substantial effect on learning. However, existing evidence suggests that the most promising approaches can increase learning by as much as eight months.

Early numeracy approaches appear to benefit all groups of children, including children from low-income families. There is some evidence that targeted early numeracy approaches, including small group activities, can help children from disadvantaged backgrounds catch up with their peers by reception and Year 1, though not all approaches appear to be equally effective.

There is some evidence that the benefits from early years approaches can be sustained through primary school, though in a number of studies the effects tend to decrease over time, which underlines that not all numeracy approaches are likely to be equally effective.

Commonly, the most effective early numeracy approaches include small group work and balance guided interaction, with direct teaching and child-led activities. A number of studies also indicate that it is important for early years professionals to understand young children's mathematical development (such as the typical stages in learning to count) and to understand how to assess this development. This understanding will support the provision of more effective activities.

How secure is the evidence?

There is a moderate level of evidence related to early numeracy approaches. The evidence base includes two [meta-analyses](#) and a number of high-quality single studies, mainly from the USA.

Findings are consistently positive, but there is some variation between programmes. A challenge for evaluations to date has been that numeracy approaches often have a multiple elements, meaning that it is hard to definitively state the essential features of an effective programme. More studies in UK settings would be valuable.

What are the costs?

Research indicates that knowledge of mathematics, of children's development and development trajectories in mathematics and understanding of the kinds of activities which support early mathematical learning are all important. As a result, professional development is likely to be particularly beneficial in supporting early numeracy approaches, and some assessment and professional development costs are included in this estimate. Additional equipment to support mathematical experiences such as counting, measuring and using money is also likely to be beneficial. Overall the costs are estimated as very low.

What should I consider?

Have staff been provided with professional development to support the introduction of early numeracy approaches?

Have you considered approaches that involve small group work or guided instruction?

How will you monitor the impact of your early numeracy strategy?

Extra hours

£ £ £ £ £

**+3**
months

What is it?

Increasing the amount of early years education a child receives at a given time. Most commonly extra hours are provided by switching from half-day to full-day provision. For an assessment of the evidence related to starting early years education at a younger age, see "[Earlier starting age](#)".

How effective is it?

Findings from studies that compare full-day early years provision to half-day provision are mixed. Evidence from the Effective Provision of Pre-school Education (EPPE) project in the UK found that, on average, children who received full day provision did not have higher early reading or numeracy outcomes compared to those who only attended for a half-day. However, some studies from the USA indicated that there was a moderate positive effect of attending full-day rather than half-day kindergarten. Across all studies, the average impact is approximately equivalent to three additional months' progress.

There are also some indications that any learning gains related to extra hours may not be sustained into primary school unless the quality of provision in the extended time is of a high quality. The EPPE study suggested that one of the strongest predictors of attainment in schools at 11 is the presence of an effective reception teacher, and this finding is consistent with a number of US studies where short term improvements related to extra hours appear to "wash out" in primary school.

However, it is also possible that benefits related to extra hours vary between different groups of children. In the US studies, children from disadvantaged backgrounds benefitted more than their peers from full-day provision. Though, on average, the EPPE study did not find full-day provision to be associated with increased learning, for disadvantaged learners increasing the total number of hours in early years education was associated with greater progress.

It is not possible to tell from existing evidence whether providing extra hours is a more promising strategy for three-year olds or four-year olds.

How secure is the evidence?

There is a moderate amount of evidence about extra hours, but findings are not consistent. The most robust evidence in terms of study design comes from trials in the USA. However, in these studies children are most commonly aged 5, which may make it difficult to draw secure conclusions about the impact of extra hours on three and four year olds. In addition, there may be differences between the UK and US contexts that could result in different outcomes. Overall, the evidence base is limited.

The highest quality UK evidence comes from the EPPE project. The study looked at the association between different kinds of pre-school provision and young children's learning, and involved 3,000 children. However, its correlational design means that it cannot rule out some alternative explanations for its finding that half-day provision is as effective full-day provision.

Given the high cost of increasing the number of hours of provision, particularly moving from half- to full-day, it would be important to evaluate the impact of any activity in this area.

What are the costs?

Overall, the costs are estimated as very high. A full time pre-school place costs about £4,000 more than a half-time place for 40 weeks, or approximately an additional £100 per week. Given the high cost and mixed evidence, it is likely that focusing on improving the quality of provision before considering changing the amount of provision within the day is a promising strategy.

What should I consider?

The evidence on full-day versus half-day provision is not conclusive.

If you are planning to provide extra hours, how will you ensure that the quality of provision in this time remains high?

How will you assess the short and medium term impact of offering extra hours?

Are you confident that you have done everything you can to improve the quality of provision in your setting before considering offering extra hours?

Parental engagement

£ £ £ £ £

**+5**
months

What is it?

Actively involving parents in supporting their children's learning and development. Strategies include: approaches that encourage parents to read and talk with their children at home or to participate in activities in the early years setting; programmes that focus directly on parents themselves, for example, providing training in parenting skills or adult numeracy and literacy support; and more intensive programmes for disadvantaged families or families in crisis, for example, through counselling.

How effective is it?

Parental engagement in early years education is consistently associated with children's future academic success. On average, parental engagement programmes evaluated to date have led to a positive impact of approximately five additional months' progress over the course of a year. However, there does appear to be some variation in effectiveness between programmes, suggesting that careful thought is needed when developing and introducing parental engagement approaches, and that on-going monitoring and evaluation is essential.

Approaches that encourage general parental engagement, for example, by encouraging parents to read with their children can have a small positive impact for all children, including those from low-income families. Studies highlight the benefits of reading to children before they are able to read, and then of reading with children as soon as they are able to read. A number of studies have identified the positive impact of encouraging parents to talk with their children.

Approaches that focus on developing parents own skills, for example by providing structured training, can have a moderate positive impact on learning. In general, more intensive approaches are associated with higher learning gains.

How secure is the evidence?

Overall, there is moderate evidence related to parental engagement programmes in the early years. There is a long history of research into parental engagement, and the association between parental engagement and a child's academic success is well established. However, there is clear need for more high quality evaluations of programmes that have tried to increase involvement to improve learning. Currently, though it is clear that parental engagement is valuable, much less is known about how to increase it, particularly in low-income communities.

Many of the highest quality studies conducted to date are from the USA.

What are the costs?

The costs of different approaches vary enormously, from running parent workshops (about £80 per session) and improving communications, which may be inexpensive, to intensive family support programmes with specially trained staff. The cost of a specialist community or home liaison worker is estimated at about £35,000. Overall, costs per child are estimated as moderate.

What should I consider?

Have you provided simple guidance to parents about how they can support their child?

Home visits can help parental engagement, but aren't always essential. How can you make your setting welcoming, to encourage regular attendance from parents?

How will you monitor the impact of your parental engagement approach?

Physical development approaches

**+2**
months

What is it?

Physical development approaches aim to improve young children's physical growth, skills and health. Activities in this area may be focused on a particular aspect of physical development, e.g. fine motor skills related to writing, or be more general, for instance, encouraging active outdoor play.

This summary focuses specifically on the relationship between physical development approaches and learning. However, it is important to note that in many cases early learning is not the primary focus of the approaches covered. Although in some cases physical development interventions are introduced with a specific learning aim (e.g. the use of number lines to promote 'number sense'), in many cases early learning outcomes are secondary to physical development itself, or to a variety of health outcomes.

How effective is it?

Existing studies suggest that physical development approaches are associated with a small improvement in cognitive outcomes, equivalent to approximately two additional months' progress.

However, though the overall picture is positive, the evidence base is not well-developed and findings are inconsistent. It is not possible to provide a clear account of the reasons why some physical development approaches are effective, and very few individual interventions have been evaluated to a high standard. In several cases, claims are made about the positive impact on learning of specific physical development approaches that are not supported by rigorous evaluation. There is some evidence that programmes that combine physical activity with strategies to promote self-regulation can improve executive function and have a positive impact on learning.

Evidence relating to the general positive impact of physical activity on cognitive outcomes is currently stronger than that related to specific programmes, and provides some indications that physical activity, including outdoor play, can support children's learning.

No high-quality evaluations have assessed the long-term impact of physical development approaches on learning.

How secure is the evidence?

The evidence base related to physical development approaches is currently limited. Two recent [systematic reviews](/evaluation/glossary/#systematic-review) have been conducted, but the reviews did not identify high-quality evidence related to learning outcomes for young children. No high quality studies appear to have been conducted in early years settings in England. Given the weak evidence in this area, it is important to evaluate the impact of any new physical development approaches and it would be valuable for early years professionals to be cautious about the claims of new interventions that do not appear to have been evaluated.

What are the costs?

Overall, the cost of introducing physical development approaches is estimated as very low. The provision of outdoor space and play equipment can be expensive, but these are not essential for physical activity and exercises, and costs are likely to be spread over a number of years.

What should I consider?

Physical development approaches can have a range of positive benefits, but the existing evidence related to learning is currently limited. How will you evaluate the impact of new approaches?

Have you considered introducing approaches that are linked to other, more well-evidenced strategies such as self-regulation?

There is some evidence that children are likely to learn more effectively after physical activity. Are regular opportunities for active play and physical development integrated into the day?

Physical environment

£ £ £ £ £



0
months

What is it?

Changing the design or quality of the physical learning environment, either by moving to a new building, or seeking to improve the design, decoration, air quality, noise, light or temperature of an existing learning space.

How effective is it?

Overall, changes to the physical environment of early years settings are unlikely to have a direct effect on learning, once an adequate building standard has been achieved. Moving to a new building or learning space could be an effective part of a process of change designed to alter behaviour or facilitate the use of new learning strategies, but there is no evidence that new buildings or particular aspects of architecture or design improve learning by themselves.

It is clear that, for learning, the quality of interaction between early years professionals and children is more important than the quality of the physical space. As a result, it is unlikely that spending additional resources, such as the Early Years Pupil Premium, on redecoration or other changes to the physical environment of a setting would be an effective strategy.

Where a new building or learning space is used as a catalyst for change, there is some evidence supporting the impact of co-design, or involving potential beneficiaries, such as education professionals and the children themselves, in taking responsibility for learning spaces and changing their behaviours as they adapt to new settings. There is some evidence that outdoor learning environments can change behaviour, for example, by increasing group interaction, but it is not currently known whether this leads to improvements in learning.

Most individual factors in the physical environment show a relationship with learning only at the extremes, and environmental factors in most early years settings are generally already at appropriate levels. Two exceptions are air quality and high noise levels. The evidence suggests that low air quality does have a negative impact on learning (reducing word recognition by 15% in one study of primary school pupils), and that classrooms and other learning spaces often have poor air quality conditions, with higher CO2 concentrations than the average recommended levels. If the noise levels are very high (e.g. the setting is under the flight path of an airport), there can be a measurable detrimental effect on learning.

The evidence on playing music in a setting is inconclusive as it appears that people react differently to different kinds of music according to their preferences. The evidence on colour in the learning environment is similar: personal preference is probably more important than any general effect.

How secure is the evidence?

The research on the impact of the physical environment on learning is generally weak; it is mainly based on correlational studies or inferences from wider environmental research. Very few studies have been conducted with rigorous **experimental designs**, and this makes it hard to establish causal claims about the impact of any physical changes to the learning environment.

What are the costs?

It is difficult to estimate the costs of physical changes as they are usually part of capital spending, rather than a recurring part of a budget. A new purpose-built nursery school costs about £1-2 million for 100 children. However, several generations of children are likely to use the building. Improving air quality can be done relatively cheaply with better ventilation, filtration and the use of dehumidifiers where necessary. Overall, per child costs are estimated as low.

What should I consider?

How does the design and layout of your setting support quality learning interactions?

If you are making changes to the physical environment, have you considered using this as an opportunity to improve the attitudes and expectations of children or families?

Have you tested the air quality in your setting? In some cases improving air quality may be as simple as opening the windows!

Play-based learning



+3
months

What is it?

Play can be broadly defined as an enjoyable activity that is pursued for pleasure or its own sake. It can be contrasted with activities that have explicitly defined learning outcomes, or games, which are likely to have clearer rules or a competitive element. Play-based activities might be solitary or social, and involve a combination of cognitive and physical elements. Activities might be adult-guided, for example through the suggestion of a scenario for pretend play. In other cases, activities will be largely child-initiated (“free-play”), with adult involvement focused on the provision of props, or the management of the learning environment (see [Physical environment](#)).

Some examples of play-based learning may overlap with [Self-regulation approaches](#) or [Social and emotional learning strategies](#). For children with social, emotional or behavioural problems, some play-based interventions have been developed. These programmes explicitly aim to improve social and cognitive skills by teaching children how to play.

How effective is it?

The evidence base for play-based learning is weak and diffuse, but does indicate a moderate positive relationship between play and early learning outcomes. On average, studies of play that include a quantitative component suggest that play-based learning approaches improve learning outcomes by approximately three additional months. However, there is substantial variation below this average and in relation to different learning outcomes, suggesting that additional, high-quality research is needed in this area.

Positive outcomes have been identified for a range of early learning outcomes including vocabulary, reasoning and early numeracy. Evidence related to early language and problem solving outcomes is more mixed. Play-based therapy can have substantial benefits for children who are identified as having social, emotional, or educational difficulties. There is no clear evidence whether play-based learning has a differential positive benefit on children from low-income families.

How secure is the evidence?

There is currently very limited evidence related to play-based learning in the early years. Though one [systematic review](#) and one [meta-analysis](#) have been conducted, the underpinning studies are relatively low quality, and frequently do not include quantitative impact measures. The majority of studies have been conducted in the United States, and the evidence base is relatively dated, including a number of studies from the 1990s.

Where studies have been conducted, for example, in a randomised controlled trial assessing the impact of the Tools of the Mind curriculum, play is often only one component of a broader programme, making it challenging to isolate its impact. It is important to recognise the methodological challenges of evaluating approaches that are part of multi-component interventions and that are, in many cases, unstructured by definition. However, more could be done than has been to date and this is an important area for further research.

What are the costs?

Most early years settings are equipped with indoor and outdoor play facilities, so the additional costs associated with play-based learning are likely to be very low. Specific additional resources and materials may be needed, such as for dramatic play, and training for staff in developing their understanding of how to develop children’s learning from play activities is likely to be beneficial. This includes training to support decisions about when not to intervene during child-initiated play.

What should I consider?

Have you considered how the learning environment affects play? How does the way you organise resources support active learning, play and exploration? For example, can children access resources independently?

How effectively does your environment encourage and support children to develop their language, literacy and mathematical understanding through play?

How does the balance between child-initiated play and more structured activities meet the learning needs of your children?

How confident are your staff in effectively supporting learning through child-initiated play?

How will you evaluate the impact of any new play-based approaches you introduce?

Self-regulation strategies

**+7**
months

What is it?

Children's self-regulation skills (sometimes referred to as executive function, or learning capability) reflect their ability to manage their own behaviour or learning. In the early years, efforts to improve self-regulation often seek to improve levels of self-control and reduce impulsivity. Activities typically include supporting children in articulating their plans and learning strategies and reviewing what they have done. A number of approaches use stories or characters to help children remember different learning strategies. It is often easier to observe children's current self-regulation capabilities when they are playing or interacting with a peer. Self-regulation strategies can overlap with [Social and emotional learning strategies](#) and behaviour interventions.

How effective is it?

The development of self-regulation and executive function is consistently linked with successful learning, including pre-reading skills, early mathematics and problem solving. Strategies that seek to improve learning by increasing self-regulation have an average impact of seven additional months' progress. A number of studies also suggest that improving the self-regulation skills of children in the early years is likely to have a lasting positive impact on later learning at school, and also have a positive impact on wider outcomes such as behaviour and persistence.

There are some indications that children from disadvantaged backgrounds are more likely to begin nursery or reception with weaker self-regulation skills than their peers. As a result, embedding self-regulation strategies into early years teaching is likely to be particularly beneficial for children from disadvantaged backgrounds.

More evaluation is needed to identify specific programmes or curricula that are effective in improving self-regulation for young children. However, the small number of studies that have been conducted in early years settings, and existing evidence from older age groups, suggests that promising approaches are likely to balance explicit instruction with providing scaffolded opportunities for children to practice new skills. For example, early years practitioners might talk to children about how to follow a "Plan, Do, Review" approach for a simple building activity.

How secure is the evidence?

Though promising, the evidence related to self-regulation strategies in the early years is currently limited. Specifically, though several studies have established the link between self-regulation and success in learning, fewer have assessed the educational impact (for example on early mathematics or literacy skills) of approaches that sought to improve self-regulation. In addition, though many interventions include components that seek to improve self-management and self-regulation, it has not been possible to isolate the improvement attributable to these elements.

Much of the evidence in existing syntheses of research relates to older children in primary and secondary school (age 5 and older). The evidence is strongest for immediate impact on behavioural outcomes (such as on interaction or persistence). Overall, self-regulation is clearly a promising area, but one that would benefit from more rigorous evaluation in early years settings to identify how to achieve short and longer term benefits.

What are the costs?

The overall costs are estimated as very low. There are few, if any, direct financial costs associated with this approach. However, high-quality professional development is likely to enhance the benefits on learning. Additional resources such as books for discussion may also be required.

What should I consider?

Self-regulation strategies have high potential, but may require careful implementation. Have you set aside time for professional development prior to putting a new strategy in place?

How do you assess children's current executive function, for example when they are playing or interacting with their peers?

How will you monitor the impact of self-regulation strategies?

Social and emotional learning strategies

£ £ £ £ £

+ 3
months

What is it?

Social and emotional learning (SEL) strategies seek to improve learning and wider child development by improving children's social and emotional skills. They can be contrasted with approaches that focus explicitly on the academic or cognitive dimensions of learning. SEL strategies might seek to improve the ways in which children interact with their peers, parents or other adults and are often linked with **self-regulation strategies**. Two broad categories of SEL strategy can be identified:

- Universal programmes that seek to improve behaviour or engagement throughout settings.
- Specialised programmes targeted at children with emotional, behavioural or learning difficulties

In 2005, the national Social and Emotional Aspects of Learning programme was introduced in early years settings to support effective learning, positive behaviour, attendance, and emotional well-being.

How effective is it?

Existing evidence suggests that SEL strategies can have a positive impact on social interactions, attitudes to learning, and learning itself. On average, children who follow SEL interventions make around three additional months' progress in early years settings and reception classes. Though, on average, all children benefit, there is also some evidence that social and emotional approaches can benefit disadvantaged children more than their peers.

However, though universal SEL strategies almost always improve emotional or attitudinal outcomes, not all interventions are equally effective at improving early learning outcomes. Improvements seem more likely when approaches are embedded regularly into activities, and when the introduction of SEL approaches is linked to professional development to support and explain the strategies to staff.

A small number of studies have assessed the impact of specialised programmes for children with emotional or behavioural difficulties. On average, these programmes show a moderate positive impact on learning. Again, there are some indications that programmes involving professional development for staff are associated with greater improvements. In addition, the quality of implementation of the programme and the degree to which early years professionals and other staff were committed to the approach appeared to be important.

How secure is the evidence?

There is very limited research in this area. There are a number of **meta-analyses**, though more research has been undertaken with children in primary schools than in early years settings, and more studies have evaluated the impact on disadvantaged or low attaining children or those with emotional and behavioural difficulties.

In early years settings, SEL approaches are often part of multi-component interventions so it is difficult to isolate the impact of the different social, emotional and cognitive dimensions.

What are the costs?

Universal approaches that encourage social and emotional learning throughout a setting will benefit from professional development and may require new materials and resources, but these costs are likely to be very low. Social and emotional strategies targeted at specific individuals will be much more expensive. Estimates from the US suggest targeted programs cost about £2,800 per child per year and involve professional counselling or psychological services. On average, the costs per child are estimated as moderate.

What should I consider?

- Have you ensured that the right professional development opportunities are in place to support the introduction of SEL strategies, and explain their value to staff?
- How will you embed SEL strategies in routine practices, rather than treating SEL as a distinct area of focus?
- How will you evaluate the impact of SEL approaches?